

DRAFT: A VISION FOR MISSOURI'S TRANSPORTATION FUTURE

Long Range
Transportation Plan



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INTRODUCTION

Welcome to Missouri's Long Range Transportation Plan, our full-length report that provides context and detail to support "A Vision for Missouri's Transportation Future." This report is part of the federally required long range planning initiative of the Missouri Department of Transportation.

This report addresses how we can meet Missourians' expectations for Missouri's transportation system over the next 20 years. Between January and July 2013, we spoke with thousands of Missourians throughout the state during our On the Move initiative. Here, we translate those conversations into long range planning goals, and we consider how to achieve those goals given the limitations of today's transportation system and the realities of current and future funding levels.

Missouri's transportation system is complex. Transportation decision making and funding is spread among many partners — legislators, MoDOT, local governments, metropolitan planning organizations, regional planning commissions, transit providers, privately-owned rail freight operators, transportation stakeholders and many others. In this report, we offer a snapshot of how these partners relate and how their respective transportation assets interconnect. Together, these pieces and partners form Missouri's statewide transportation system.

In this report, we capture the issues, challenges and priorities of Missouri's statewide transportation system. We examine:

- **Trends** (including demographic, economic and travel) that will impact transportation in the next 20 years – Chapter 2
- The current state of **Missouri's transportation system**, including highways, bridges, transit systems, railroads, airports, waterways and bicycle and pedestrian facilities-Chapter 3
- The **Financial Situation** including current status and outlook-Chapter 4
- **Feedback** from On the Move, the largest and most impactful community engagement effort MoDOT has ever undertaken – Chapter 5
- **Missouri's Four Transportation Goals** – Chapter 6 – including:
 - **Take care of the transportation system** and services we enjoy today
 - **Keep all travelers safe**, no matter the mode of transportation
 - Invest in projects that spur **economic growth and create jobs**
 - Give Missourians **better transportation choices**
- **Delivering transportation solutions** will improve business practices and collaboration with partners – Chapter 7
- **How to move forward** towards Missouri's transportation vision, including specific strategies to achieve the transportation priorities Missourians have identified – Chapter 8

In addition, this report includes several appendices:

- **A more detailed summary of On the Move** – Appendix A
- **District-specific feedback from On the Move** – Appendices B through H
- **Economic impact case studies** examining how investments in transportation projects helped spur economic growth and job creation – Appendix I
- **The planning framework for transportation decision making** identifies which improvements should receive funding working in concert with planning partners, stakeholders and the general public – Appendix J
- **Other planning efforts** that inform and influence the vision and priorities established by Missourians and that will be carried out by MoDOT – Appendix K
- **Transportation wants, needs and projects** suggested through On the Move and other outreach efforts – Appendix L

TRENDS

How people get to work, how senior citizens get to the doctor, how food is delivered from the farm to the market, how jobs are created, how our economy grows — these are all trends that influence the way Missourians use the transportation system. By understanding these trends, Missouri can better plan the system of roads, rails, ports and airways that will be needed 20 years from now.

What will Missouri be like 20 years from now? Transportation planners observe current demographic, economic and travel trends to help paint a picture of what Missouri's future transportation needs are likely to be in Missouri. This chapter provides a detailed look at a variety of important population, economic and travel trends. Key takeaways that will influence how Missourians will use the transportation system in the coming decades:

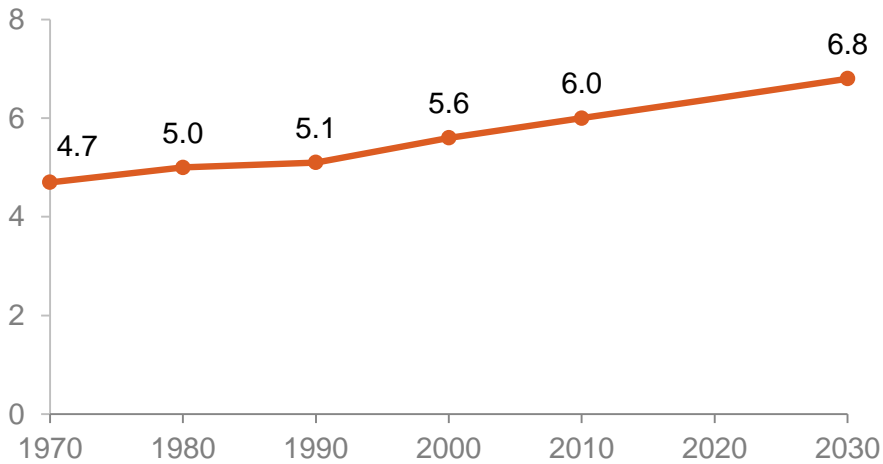
- Overall demand for transportation will increase as the population in Missouri grows.
- In the foreseeable future, the most popular choice for travel is the personal vehicle, so roadway congestion, safety and maintenance will continue to be transportation concerns.
- Changing demographics and preferences may mean that more people will rely on alternative modes to get around, such as public transportation. The factors influencing this change include growth in the older and lower income populations and changes in the travel preferences of younger generations.
- While driving is, and in all likelihood will continue to be, the primary means of travel in Missouri, there are indications that the decades-old trend of increased driving may be slowing. This trend will need to be closely observed, as it impacts not only the needs of the transportation system, but also the reliability of future revenue streams.
- Trends can vary across the regions of the state, underscoring the benefits of a flexible planning process that can adapt to local needs.

A Growing Population

Generally, as population increases, demands for transportation also increase — more miles are driven on our highways and more people ride buses, airplanes, trains and bicycles. Between 2000 and 2030 Missouri's population is predicted to grow by roughly 1.2 million people, a 21 percent increase, for a total population approaching 6.8 million people in 2030.

Historically most of Missouri's population growth has come from natural increase, defined as more births than deaths, rather than from migration into the state. However, in the 1990s and early 2000s more people migrated into Missouri than migrated out. This slightly positive migration trend was factored into the official population projections. From 2010 through 2012, however, census data shows a negative migration trend with more people leaving the state than entering. This recent trend could influence estimates of total population and age distribution, which affect anticipated transportation needs.

Figure 2.1 - Missouri Population (in millions)



Source: Missouri Office of Administration, Division of Planning and Budget

Lower Incomes Limit Mobility

According to the U.S. Census, roughly 16 percent of Missourians live below the poverty level. For Missourians living below the poverty level, it becomes increasingly difficult to get to and from a job or seek out a prospective job if your transportation choices are limited.

The median household income in Missouri was \$37,828 in 1999 and \$45,247 in 2011. While the actual median income dollar amount increased between 1999 and 2011, the median income stretched further in 1999. In 1999 the median income had roughly the same purchasing power as \$51,074 in 2011 dollars. This means that Missourians' "real" median income decreased by more than 11 percent between 1999 and 2011.

This income decline is not evenly spread throughout the state. A report by the Center for Budget and Policy Priorities (CBPP) and the Economic Policy Institute (EPI) indicates that while incomes decreased for the half of the population with average or below average earnings, incomes have actually increased for the wealthiest 5 percent of Missourians.

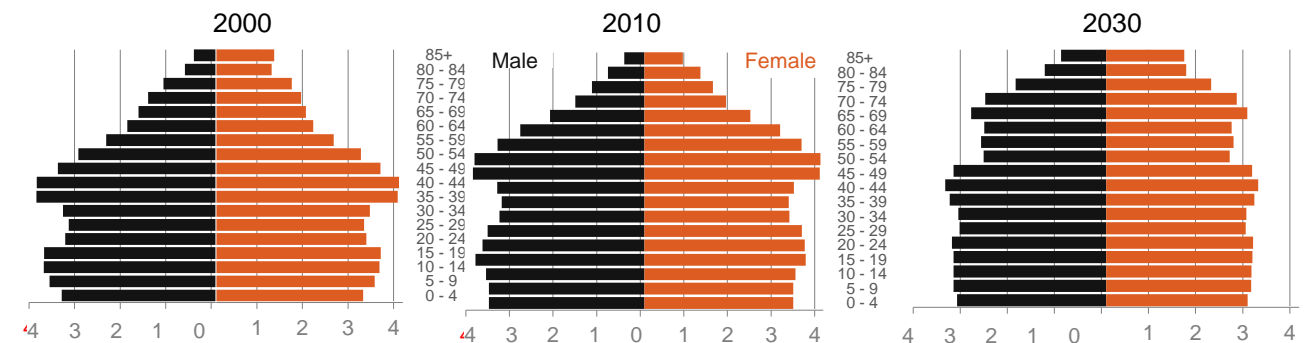
Where lower-income populations reside can influence the transportation system. According to the U.S. Census Bureau Small Area Estimates Branch, the 10 counties with the lowest median incomes are all located in rural areas. Low-income individuals are likely to have only one or no vehicles available, and rural areas tend to offer less public transit or other travel options. Thus, mobility for the rural poor could become a critical problem if incomes continue to decline.

An Aging Population

The percentage of the Missouri population aged 65 or older has steadily increased at least since the start of the last century. People aged 65 and older were 5 percent of the population in 1900, 10 percent in 1950 and 15 percent today. This trend is expected not only to continue, but also to accelerate. Projections suggest that by 2030, 20 percent of the population will be aged 65 or older.

Missouri's aging population will affect the types and number of drivers on the road, the needs of those drivers and the necessary safety upgrades that will be required in the very near future. For instance, an increase in older drivers will require an increase in road safety measures, such as improved signage, more visible lane demarcations or additional driver's testing requirements.

Figure 2.2 - Population Pyramids of Missouri
Percent of Total Population by Age-Sex Group



Source: Missouri Office of Administration, Division of Planning and Budget

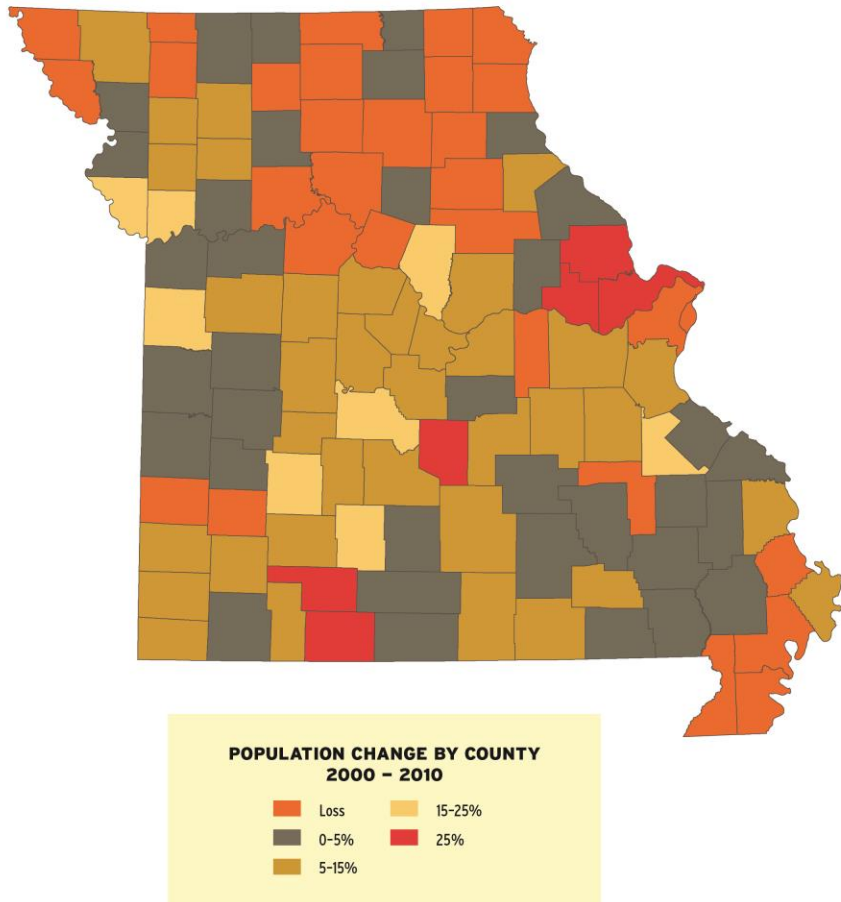
People are Moving to Urban Areas

In Missouri, as in much of the country, people have been moving from rural agricultural areas to urban areas. With the exception of the 1970s, every decade since 1900 has had a relative increase in urban population. Since the 1900s, residents living in urban areas have increased from 36 to 70 percent. Projections suggest that these patterns will continue.

U.S. Census projections also suggest the population will move more to the suburbs, which are areas where urban development gives way to rural land. Recent migration trends indicate that the next 30 years will bring large growth in the suburban counties surrounding Kansas City, St. Louis and Springfield, but significant declines in the city of St. Louis itself and in agricultural counties.

Census projections indicate that all of the top 10 fastest-growing counties will be metropolitan counties, defined as counties that include or are close to a major city. Whether this growth occurs in suburban or more densely populated urban areas will impact future transportation decisions. Urban dwellers historically drive less, while suburban residents create more concentrated rush hour traffic congestion and put more strain on the road network.

Figure 2.3 - Population Change by County 2000-2010



Source: United States Census Bureau

ECONOMIC TRENDS

Missouri's economy affects transportation in a variety of ways. The number of working people influences the amount of commuter traffic and rush hour delays. Residents' incomes determine how many people can purchase vehicles and how many opt for public transit. The overall level of business activity in the state significantly affects how much freight is moved and, to some extent, by what transportation method. This section outlines the economic trends that shape transportation planning in Missouri. These trends are:

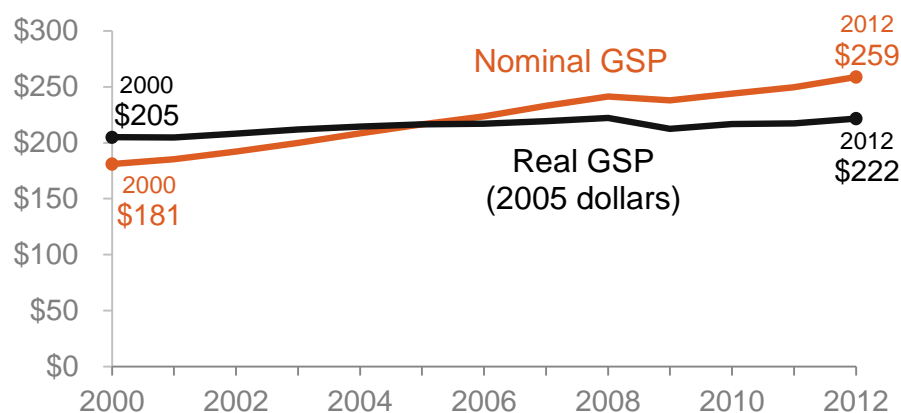
- Real Gross State Product (GSP) is still lagging pre-recession levels.
- Fuel prices are continuing a decade-long upward trend.
- Freight movement is expected to increase, and while the majority of Missouri's goods are moved by truck, more and more shipments are anticipated to use multiple modes.
- Exports, especially to North American neighbors, are vital to the state's economy and rely heavily on sound transportation.
- Expected changes in waterborne freight, trucking costs and container shipping will shift elements of the global supply chain.
- The industries that employ the most Missourians are shifting toward service and knowledge-based work.

Gross State Product (GSP) Still Lags

GSP is defined as the total amount of dollars created in a state's economy. GSP is a primary measure of basic wealth and reflects the level of business activity in a state. While Missouri's GSP has risen since 2008, all gains vanish once those dollars are adjusted to account for general price increases known as inflation. As economists describe it, nominal GSP rose since 2008, but, after adjusting for inflation, real GSP declined. After factoring in inflation, actual purchasing power in 2012 was 0.2 percent lower than it was in 2008.

The downturn in the economy since 2008 is still impacting current economic conditions. Since travel often accompanies business activity, changes in the overall level of business activity (as reflected by GSP) can reflect changes in the level of transportation activity in the state. Also, since wealth is a major factor in vehicle ownership, changes in GSP can affect how much people travel and by what mode of transportation, which subsequently impacts demands on the transportation system.

Figure 2.4 - Missouri GSP, 2000-2012 (billions \$)

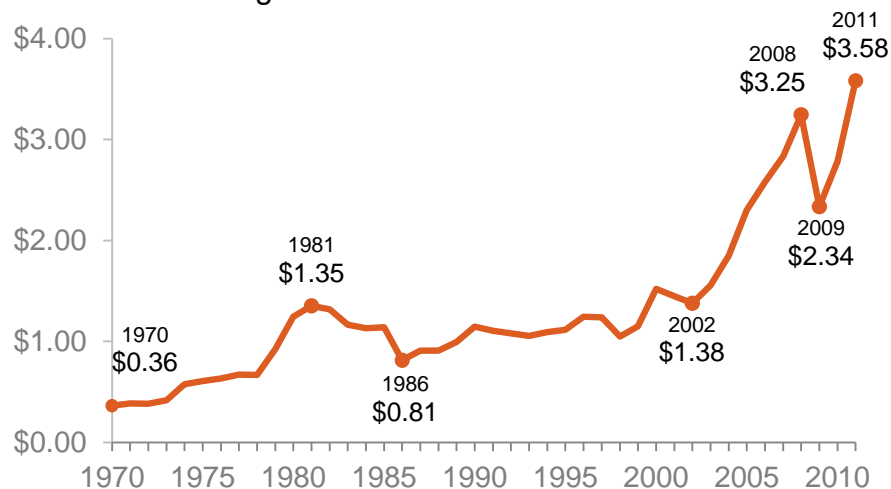


Source: U.S. Bureau of Economic Analysis

Fuel Prices Continue to Rise

Like in the rest of the nation, the price of gasoline in Missouri has fluctuated greatly in the last few years. Prices hovered around \$1.00 per gallon for most of the 1990s and stayed below \$2.00 per gallon for the first half of the 2000s. Since 2005 prices have been more volatile than in the past. Despite the price swings, gasoline prices have increased overall, more than tripling since the late 1990s.

Figure 2.5 - Missouri Gas Prices



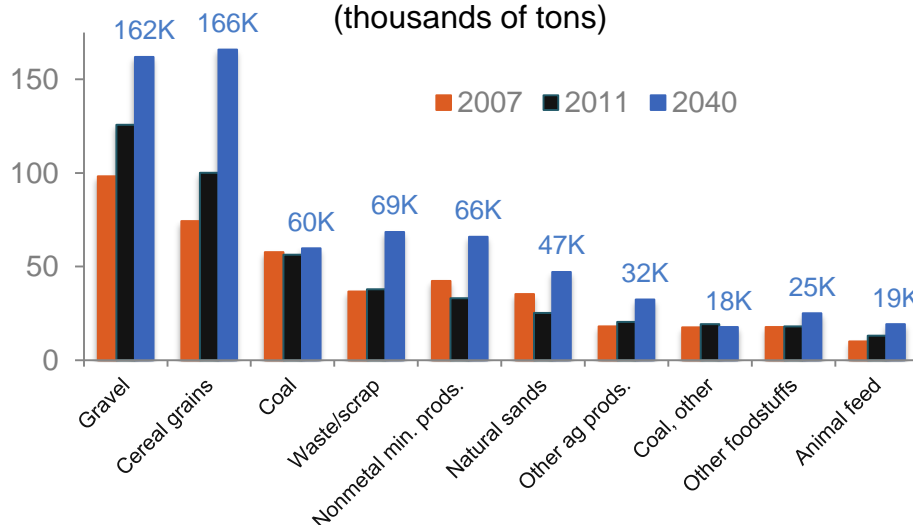
Source: U.S. Energy Information Administration

Freight is Expected Nearly to Double

More than 600 million tons of freight were shipped within, from or to Missouri in 2011. By 2040 that number is expected to increase to nearly 1 billion tons. By weight, cereal grains and gravel are by far the most significant products being shipped on Missouri's transportation network today. Because cereal grains and gravel originate in rural parts of the state, their production relies on sound road, rail and waterway infrastructure in our rural areas. For the majority of these products, Missouri is a net exporter. Coal, on the other hand, is the third largest freight commodity using Missouri's transportation network and is almost exclusively imported into the state.

The vast majority of freight in Missouri is carried by truck, as trucking is used as both a primary transportation mode and to complete connections to rail, air and waterway facilities. In 2011, 64 percent of freight traveled on Missouri's road network. While the largest commodities traveling through the state — grains, gravel and coal — are often transported by rail due to their bulk, trucks offer greater flexibility and efficiency for short-haul trips. Since the majority of Missouri's trading happens inside the state or with other central state neighbors, trucking dominates the freight industry. For freight

Figure 2.6 - Missouri's Top Freight Commodities* (thousands of tons)



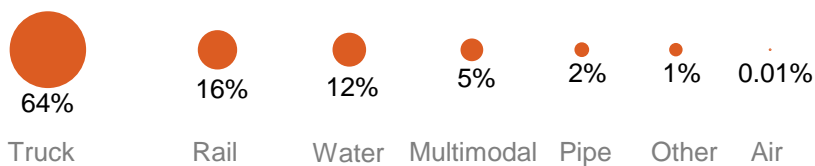
*Note: This does not include freight traveling through Missouri, only freight with an origin or destination within the state. Source: Center for Transportation Analysis, Freight Analysis Framework Summary Statistics

shipped within Missouri — those shipments where both the origin and destination are inside the state — 94 percent is shipped by truck. This intrastate freight accounts for 40 percent of all freight with either an origin or a destination in Missouri.

This reliance on trucking both for getting goods to Missouri and for exports highlights the importance of keeping Missouri's roads and bridges in good condition. Closed and weight-restricted bridges, poor pavement quality and a lack of safety updates, such as adequate shoulders, can all hamper the movement of the goods that are vital to the state economy.

However, as shown in Figure 2.7, modes other than roads are also important for freight movement. More than one quarter of Missouri's shipped products use either rail or water to reach their destinations. Maintaining rail infrastructure and ports in a state of good repair is essential for getting goods to market. Keeping intermodal connection points accessible and up-to-date is also important. Currently, 5 percent of goods use multiple modes of transport, and the share of freight using intermodal transportation is expected to rise, increasing the importance of modern and efficient intermodal facilities.

Figure 2.7 - Missouri Freight Movement by Mode*, 2011



**Note: This does not include freight traveling through Missouri, only freight with an origin or destination within the state.*

Source: Center for Transportation Analysis, Freight Analysis Framework Summary Statistics

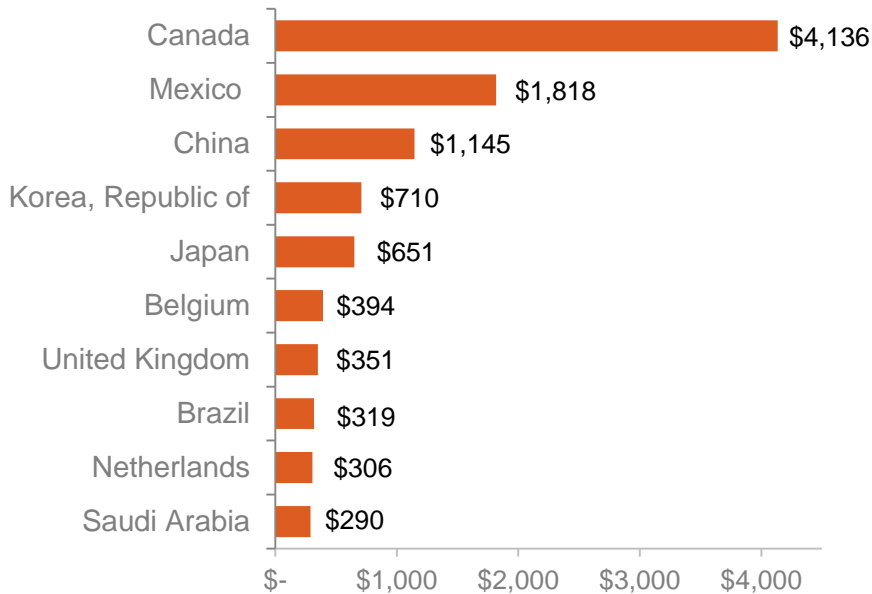
Exporters Need Reliable Transportation

Exports are an important contributor to business activity in the state. Missouri's exports to the rest of the world totaled \$13.9 billion in 2012, or 5 percent of total GSP.

Half of all Missouri international exports go to three trading partners: Canada, Mexico and China. Canada is Missouri's largest export partner, accounting for more than \$4 billion in exports in 2012. Mexico is the second largest export partner; exports to Mexico increased by \$377 million, or nearly 28 percent from 2011 to 2012.

Nearly one quarter of exports are from the production of cars and other transportation equipment, an industry that employed over 36,000 workers at an average wage of \$73,296 in 2009. As an export-oriented industry, the manufacture of transportation equipment is a significant part of Missouri's economy. According to the Missouri Department of Economic Development, the industry is approximately 75 percent motor vehicle production, 21 percent aerospace manufacturing and 4 percent other kinds of transportation equipment manufacturing. Top employers in this industry include carmakers Ford Motor Company and General Motors, aerospace giant Boeing and motorcycle icon Harley-Davidson. Other major industrial exports include chemicals, food products and machinery.

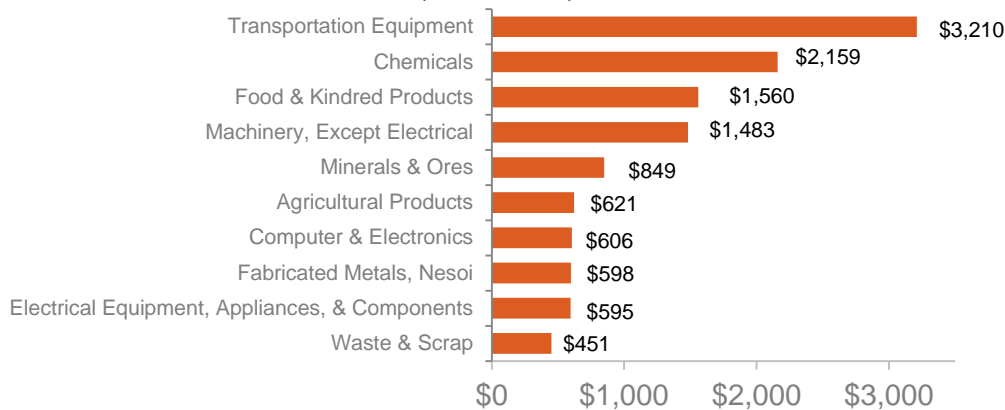
Figure 2.8 - 2012 Top International Export Partners (in millions)



Source: Missouri Department of Economic Development

Firms that export significant shares of their goods and services choose to locate in Missouri largely because of the state's access to the means of production as well as to consumer markets. For this reason, the quality and accessibility of Missouri's transportation system is important to maintaining and continuing to grow the \$13.9 billion export market

Figure 2.9 - 2012 Top Ten Missouri Exports (in millions)



Source: Missouri Department of Economic Development

The Supply Chain is Changing

The supply chain is the overall network that starts with raw materials at their source and ends with a finished product in the hands of consumers. For instance, a supply chain can include farms, warehouses, manufacturing facilities, trucks and rail cars, retail stores and the end consumer. The supply chain plays an important role in how freight is moved in Missouri. Four changes are expected to impact supply chains for years to come.

First, the Panama Canal is undergoing an expansion that will allow larger ships to pass through the canal. When the Panama Canal expansion is completed in 2015, there will be a change in waterway shipping patterns. Those ports that have already prepared for large container vessels will become the base for domestic freight movement.

Second, containerized shipments are predicted to grow substantially in the next decades. This will increase "intermodal shipping," defined as using the same container for shipping when transferring among different types of transportation modes, such as transferring from a rail car to a truck. Inland waterway freight movers, in particular, will need to upgrade facilities to be able to send and receive containerized cargo and compete in national and international markets.

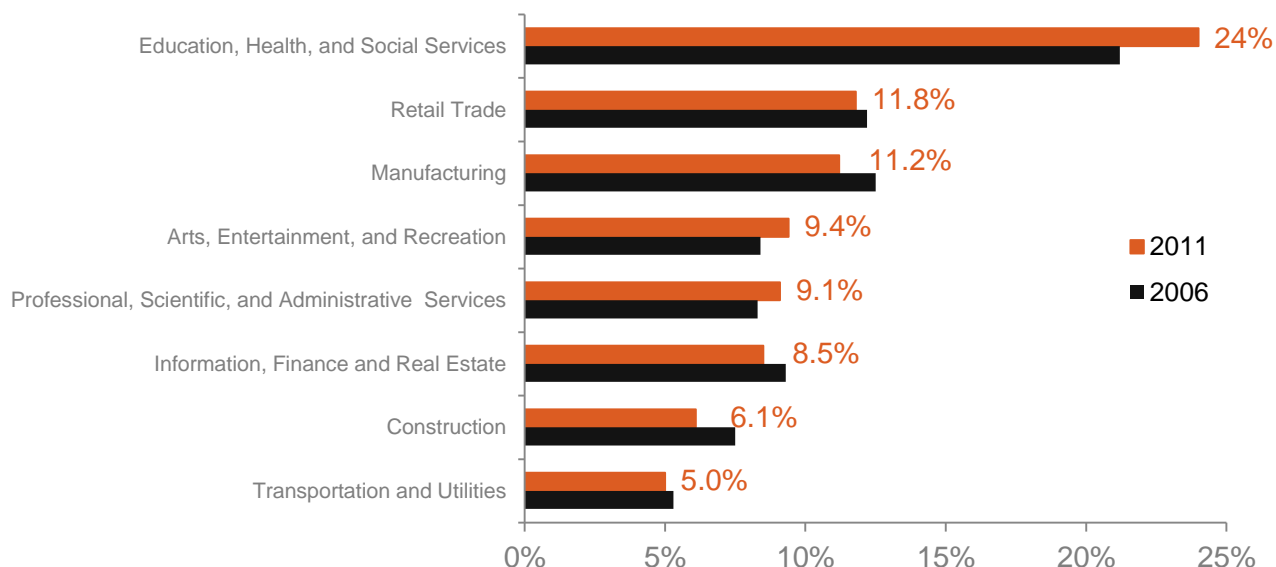
Third, costs are expected to increase in the trucking industry. A shortage of long-haul truck drivers is becoming more problematic as older drivers retire and younger drivers are not filling these openings. Adding to the problem, the new Hours-of-Service regulation that went into effect in July 2013 has decreased the numbers of hours truckers can work. This regulation, which targets improved safety on the system, increases the time needed to make supply chain connections. This regulation also may increase costs as drivers demand more pay to make up for reduced working hours and the resulting decrease in earning ability.

Finally, diesel fuel costs are predicted to rise in the coming years, which will likely shift more freight from trucks to intermodal routes where shipments would be carried by rail or waterways for a large portion of their trips. This may increase overall shipment times.

Employment Industries are Shifting

Since 2000 the numbers of employees grew fastest in the service sector, education and health services, and leisure and hospitality industries. The largest employment increase has been in the education and health industries, primarily because an aging population has increased demand for health services. Because the demand for health services is ongoing, growth in this industry had remained strong throughout the economic recession. Between 2000 and 2010 the education and health industry grew by more than 20 percent in every area of the state and by more than 30 percent in both the southeast and Ozark regions. The service and hospitality industries also grew, each by approximately 10 percent statewide.

Figure 2.10 - Missouri Employment by Industry



Source: U.S. Census Bureau, American Community Survey

Despite declines in the decade following 2000, manufacturing still plays a significant role in the Missouri economy. With 303,011 employees in 2010, down from 346,672 in 2006, manufacturing was the third largest industry for employment. It was also the second largest industry in terms of annual payroll, at just under \$11 billion. Food product manufacturing is the largest manufacturing employer, followed by production of transportation equipment, ranging from motor vehicle assembly to aerospace engineering.

The professional, scientific and technical fields are also important industries in Missouri. They account for 139,000 jobs, the fifth largest in the state, but create \$8.2 billion in payroll, the third largest in the state. This group includes biotechnology research, particularly the biomedical and animal health industries, which is a significant part of Missouri's economy.

TRAVEL TRENDS

The personal automobile still reigns supreme both in Missouri and nationally, but current data suggest that attitudes and habits may be shifting. This section examines trends in the travel choices people are making today and how these trends fit into the overall transportation system. For instance:

- Vehicle Miles Traveled (VMT) have declined in recent years, but it is unclear whether this will continue, or if it will reverse to the upward trend present through the majority of the nation's automotive history.
- Transit use has increased slightly since 2010, but Missouri still uses transit at a lower rate than the rest of the country.
- Passenger rail ridership is almost back to the peak seen in 2001, due in part to significant improvements in service.
- Since the TWA-American Airlines merger reduced flights into and out of Lambert-St. Louis International, air travel in the state has held steady, even through the last recession.
- Single occupancy vehicles are still the primary mode of commuting, particularly among older Missourians.
- Vehicle registrations, a sign of car ownership, have remained steady for a decade, but there have been slight declines in recent years.

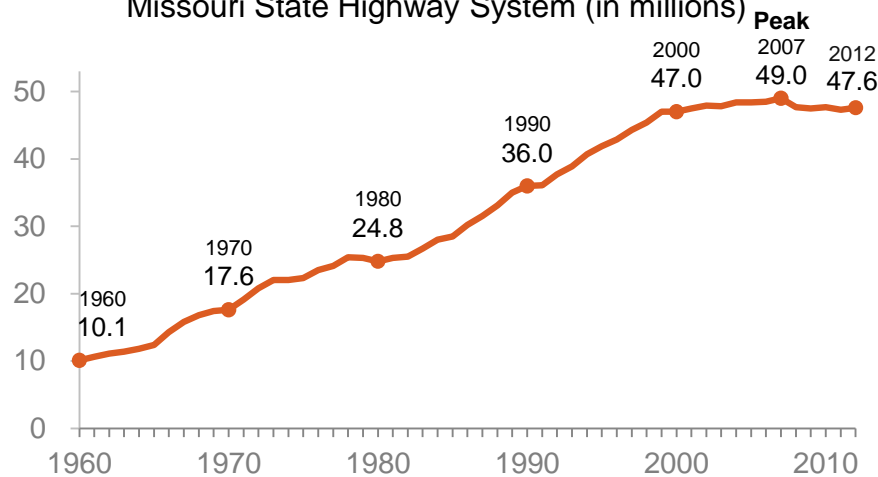
The Long-Term Trend of Growth in Miles Driven May be Wavering

People are driving fewer miles. Driving in the U.S. peaked in 2004 and has gradually decreased since then. A similar trend took place in Missouri, though the peak came later, in 2007. Nationwide, as well as in the state, the number of miles traveled by vehicles suddenly dropped in 2008, likely due to the shock of the economic problems of that year.

Trends in how much people drive are important. These trends affect demands on the transportation system and affect transportation funding because fuel taxes are a major source of revenue. When less fuel is consumed, fewer tax dollars are generated.

In the past, the number of miles traveled by vehicles increased steadily over time. It is not yet known whether the reversal in this trend marks a permanent change in habits and attitudes, or just a short-term anomaly, possibly due to the weak economic conditions of the past five years.

Figure 2.11 - Vehicle Miles Traveled (VMT)
Missouri State Highway System (in millions)

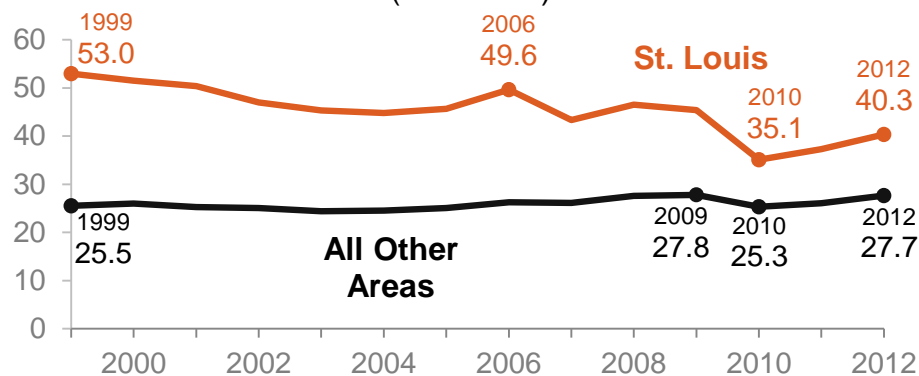


Source: Federal Highway Administration, Highway Statistic Series, "Annual Vehicle-Miles of Travel"

Focus on Public Transit

The share of Missouri's population using public transportation to get to work is smaller than the national average, less than 2 percent compared to 5 percent nationally, but transit remains very important to certain segments of the population. People who don't have cars or other vehicles rely most heavily on transit to get to work or school. According to census data, they make up just 2.5 percent of the population but are 40 percent of all public transportation users. Transit is used more frequently by low-income households and younger workers, which often are the people who don't have vehicles. Older workers, perhaps surprisingly, use transit less than the average, though nonworking older Missourians may rely on transit more.

Figure 2.12 - Annual Public Transit Ridership
(in millions)



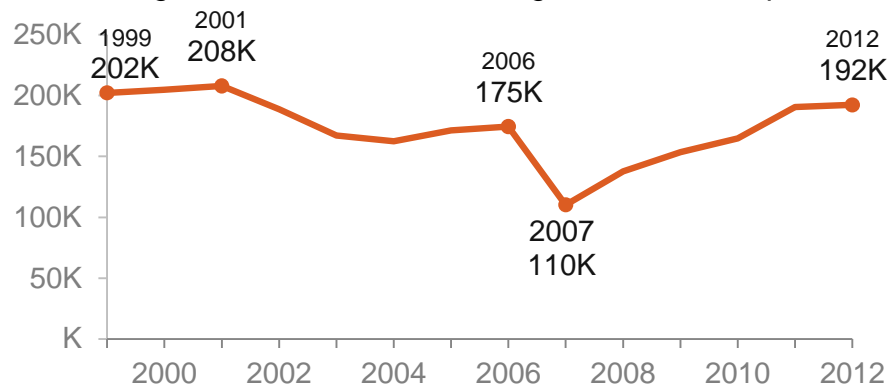
Source: Missouri Department of Transportation

Better Passenger Rail Service

Between 2001 and 2007 passenger rail ridership in Missouri fell by almost 50 percent. Since 2007, ridership across the state has been on a continuous rise, almost returning to its peak of more than 200,000 annual passengers. In particular, ridership on Amtrak's service between St. Louis and Kansas City has continuously increased since 2007. Part of the increased ridership is due to improved service and operations. On-time performance has improved from

63 percent to almost 90 percent during this timeframe, and additional service has been added for special events.

Figure 2.13 - Annual Passenger Rail Ridership

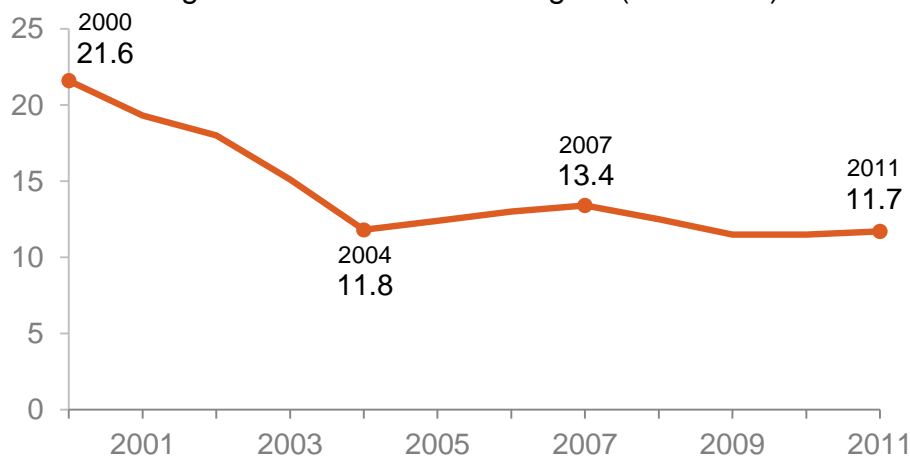


Source: Missouri Department of Transportation

Airline Travel Remains Steady

Air travel in Missouri declined significantly in the past decade, from nearly 22 million passengers in 2000 to under 12 million passengers by 2004. Since 2004, air travel passenger numbers have remained relatively steady. The initial decrease was due in large part to Lambert-St. Louis International Airport's decline as a major hub, stemming from the 2001 merger of Trans World Airlines (TWA) with American Airlines. Following the merger, American Airlines gradually reduced the number of flights from Lambert Airport, leaving St. Louis as a "mid-size" rather than "large" domestic hub.

Figure 2.14 - Airline Passengers (in millions)

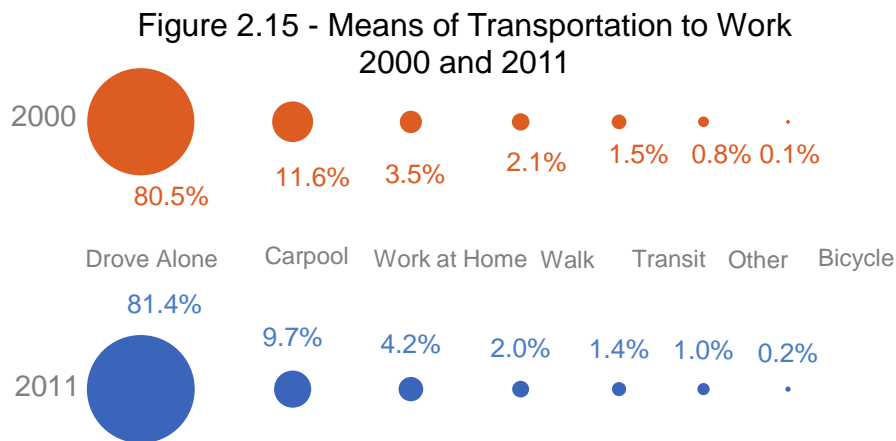


Source: Missouri Department of Transportation

Commuters Mainly Drive Alone

Not surprisingly, the personal vehicle is by far the most popular commuting option, with more than 80 percent of workers driving alone and less than 10 percent driving in a carpool. While carpooling is still the second most popular option, it is the only commuting option that has decreased in popularity since 2000, when nearly 12 percent of workers used carpools.

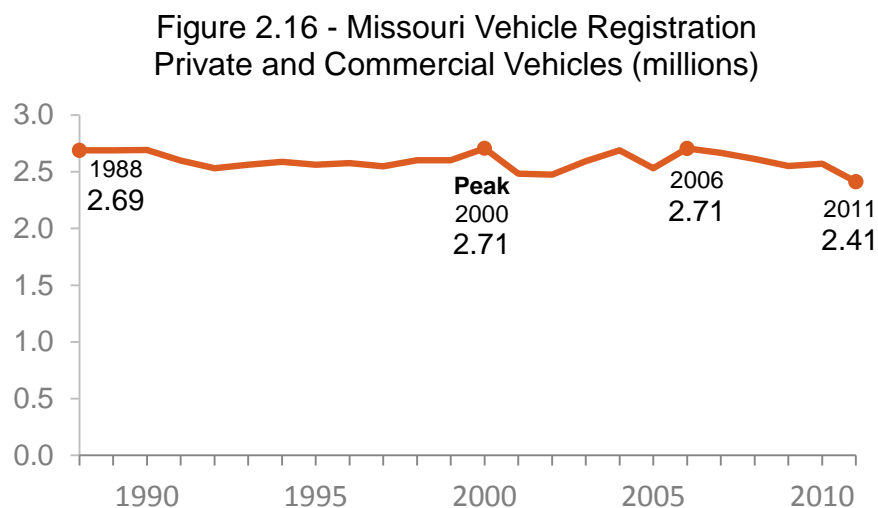
In 2011 nearly 9 percent of workers did not use personal vehicles to get to work. In both 2000 and 2011 about 1.5 percent of workers used public transportation and about 2 percent walked. While still a minor transportation mode, biking grew in popularity, increasing from 0.1 percent to 0.2 percent. Workers using taxis, motorcycles and other transportation modes increased from 0.8 to 1.0 percent. However, given the small percent of workers using these modes of transportation, these apparent increases may be within the margin of error and not true increases. Between 2000 and 2011 the percentage of workers working from home increased from 3.5 to 4.2 percent. This increase likely resulted from improvements in the availability and quality of communication technologies.



Source: U.S. Census Bureau, American Community Survey

Vehicle Ownership Declines

Vehicle ownership declined between 2000 and 2011. According to U.S. Department of Transportation data, private and commercial vehicle registrations decreased 11 percent from an estimated 2.7 million in 2006 to 2.4 million in 2011. The current level of vehicle ownership is similar to that of 2001 and 2002, when vehicle registrations also fell below 2.5 million. Because vehicle registrations have varied over the years, it is not yet known whether the decrease will be short-lived or part of a long-term trend.



Source: Federal Highway Administration, Highway Statistics Series

THE TRANSPORTATION SYSTEM

Missouri's transportation system is a vast network of highways, bridges, rural and urban buses, railroads, airports, waterways, and biking and pedestrian paths. Together, these components link people with jobs and services; businesses with suppliers, employees and customers; visitors with destinations; agricultural products with markets; and students with schools. The pages that follow describe the components that make up the transportation system that keeps Missourians connected and safe.

ROADWAYS

The majority of travel in Missouri is made possible by its large and well-connected road network that is used by personal vehicles, trucks and buses. The road network consists of a state-owned system of interstates, state highways and a local road system maintained by city and county governments.



There are 33,700 miles of State Highways in Missouri

State Highways

Missouri has the seventh largest state highway system in the United States. Each day, 130 million miles are driven and 1.1 million tons of freight are hauled on this system. It is made up of 33,700 miles of roadway, 5,500 miles of which are classified as heavily traveled "major highways" and 28,200 miles of which are defined as lesser traveled "minor highways."

Missouri's major highways, such as I-70, I-44, U.S. 36, U.S. 50, U.S. 60 and U.S. 63, encompass just 20 percent of the state highway miles but carry 80 percent of the system's traffic. Many of the busy routes in urban areas, particularly where vehicles travel between business districts and residential areas, also are classified as major highways.

Missouri's minor highways primarily serve local transportation needs and consist mostly of lettered routes such as AA, B and Z. Minor highways encompass 80 percent of the state highway miles and carry 20 percent of the state's traffic. The minor highways serve as a vital link to the agricultural industry throughout the state. In 2012, 31 percent of minor highways were in fair or poor condition.

Figure 3.1 – Highway Miles in Missouri

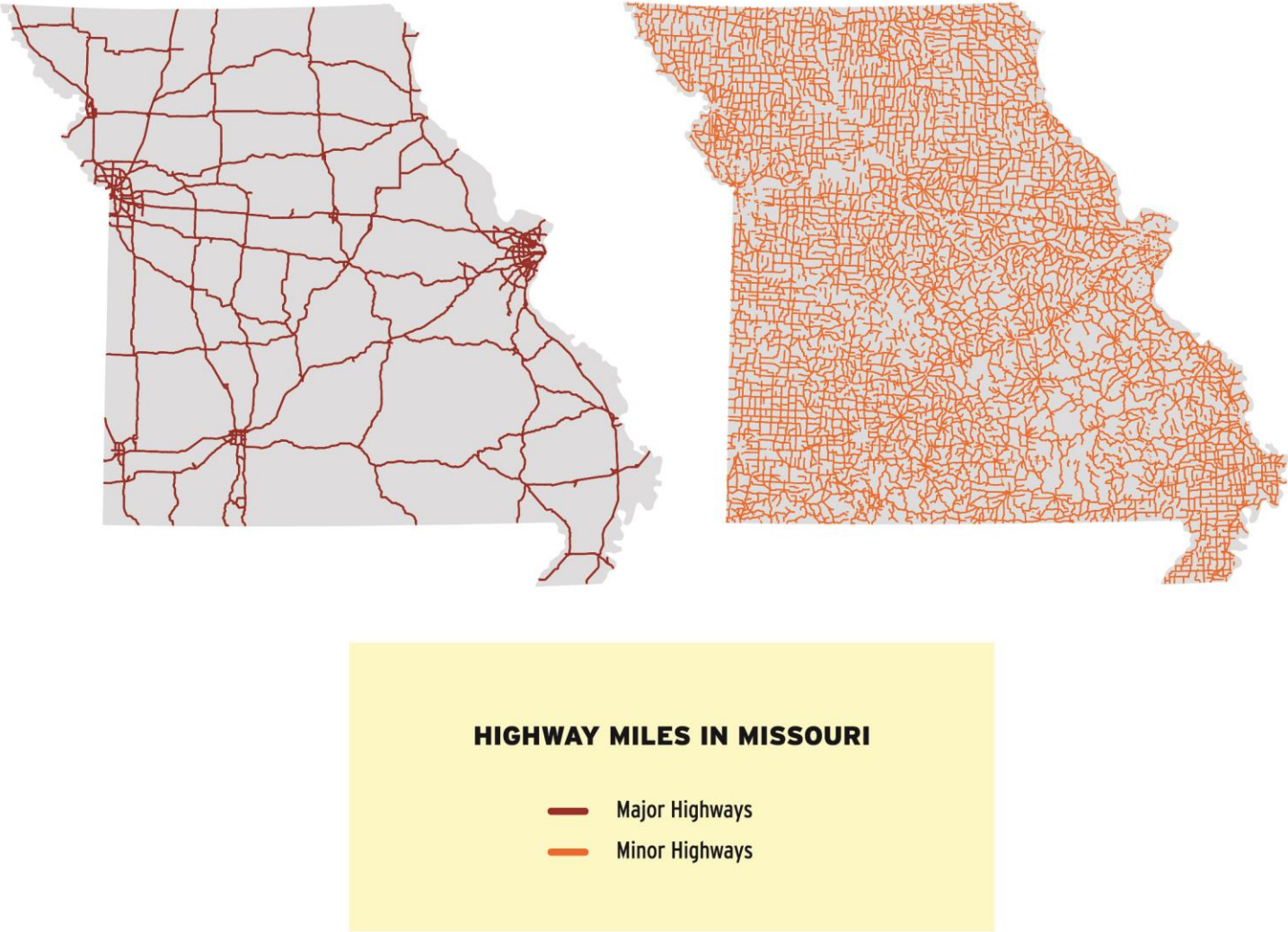


TABLE 3.1 - HIGHWAY TRAVEL/CONDITION OVERVIEW			
Major Highways		Minor Highways	
20%	Miles of Missouri System	80%	
80%	Where Travel Takes Place	20%	
12%	Percent Fair/Poor Condition	31%	

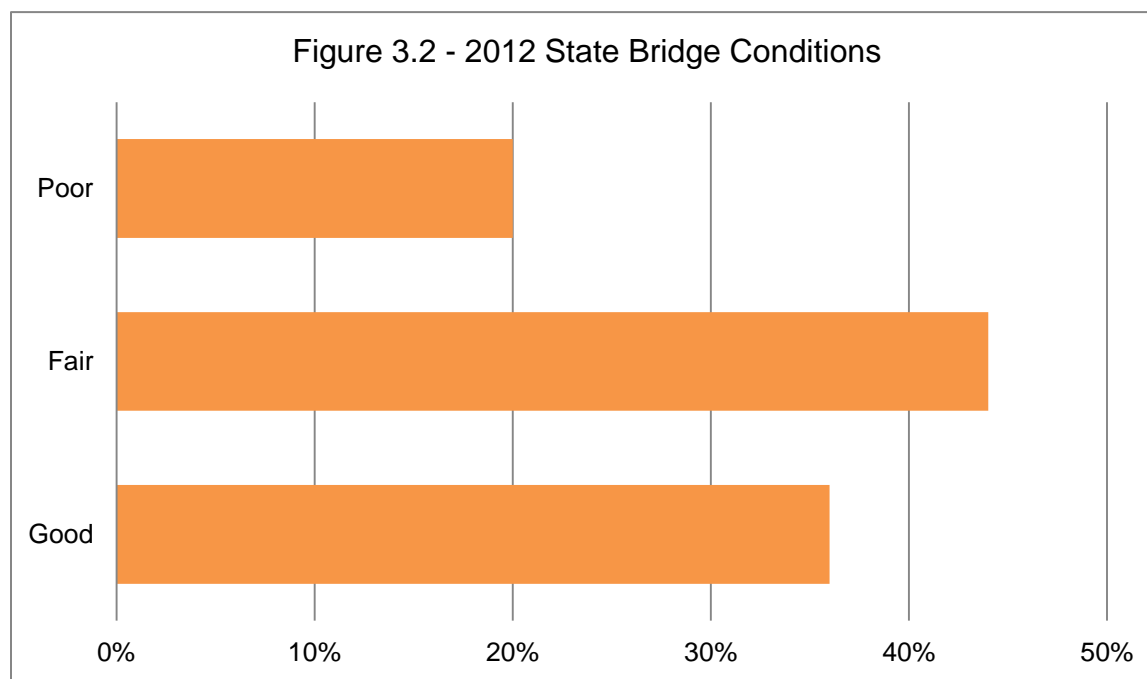
BRIDGES

Missouri's rivers, lakes and streams provide ample recreational activities and commercial activities, but create a transportation challenge to safely and efficiently move people and freight. The state highway system includes 10,364 bridges of varying sizes, including 211 major bridges that are longer than 1,000 feet, or about the length of three football fields.

Keeping close tabs on the condition of bridges is important to ensure travelers are safe. Currently, 44 percent are in fair condition, 20 percent are in poor condition and 36 percent of state bridges are in good condition.



Christopher S. "Kit" Bond Bridge in Kansas City, MO – A Major Bridge



LOCAL ROADWAYS

In addition to the state system of roads and bridges, Missouri has a large network of local roadways. These local systems include 22,800 miles of city streets, 73,600 miles of county roads and 13,800 bridges. Although these facilities are maintained under the jurisdiction of local city and county governments, the state partners with these entities to ensure the overall roadway system is safe, maintained and well-connected.

These local roads are a critical part of our state's overall transportation system. In many areas of the state, Missourians rely on these roads every single day to get kids to school, get to work or simply access everyday needs.



Typical street intersection



Typical county road in rural Missouri

PUBLIC TRANSIT

Public transit provides people with an alternative to the personal vehicle and continues to be incredibly important for many Missourians' ability to get to work, school or access to other essential services. In Missouri, transit travel mostly occurs on buses and vans, but includes other forms such as light rail and street cars. Missouri's larger cities typically offer a broad array of transit services, in some cases offering service for most hours of the day, seven days a week. Transit-dependent residents in smaller communities and rural areas typically rely on limited scheduled trips (specific days of the week or month) or on-demand services that must be scheduled in advance.

Urban Transit

Seven of the state's largest metro areas — St. Louis, Kansas City, Springfield, Columbia, Jefferson City, Joplin and St. Joseph — support urban transit systems offering a variety of services and availability. On average, 165,000 passengers board these buses each day.



The MAX Bus in Kansas City

Figure 3.3 – Missouri Urban Public Transit Systems

St. Joseph Transit “The Ride”

- Eight routes
- M-F from 5:15am to 9:05pm
- Sat. from 7:15am to 7:05pm
- Services for mobility limited passengers

Columbia Transit

- Thirteen routes
- M-Sat from 6am to early evening
- Paratransit for elderly and mobility limited passengers

The Kansas City Area Transportation Authority (KCATA)

- Sixty-eight routes
- Two rapid bus routes
- Seven days/wk from 4am to 1am
- Paratransit for elderly and mobility limited passengers
- MetroFlex, a demand-response bus service vanpool program

Metro Transit in St. Louis

- Sixty routes
- Two MetroLink light rail lines
- Seven days per week, 4am to 1am
- Call-A-Ride paratransit services for elderly and mobility limited passengers



Joplin – Sunshine Lamp Trolley

- Three one-hour loop routes that cover nearly the entire city
- M-F from 7am to 6pm
- Sat. from 9am to 4pm
- On-call and paratransit for elderly and mobility limited passengers through Metro Area Public Transit System

City Utilities Transit in Springfield

- Fourteen day routes
- Four evening routes
- 6am to 11pm most days
- Offers paratransit services for elderly and mobility limited passengers through Access Express

Jefferson City “Jefftran”

- Nine routes
- M-F from 6:45am to 5:30pm
- Paratransit services for elderly and mobility limited passengers through Handi Wheels

Rural Transit

As shown on the map below, rural transit service providers serve rural areas. OATS Inc. is a private, not-for-profit organization serving 87 of Missouri's 114 counties. Southeast Missouri Transportation Service (SMTS) serves 20 of Missouri's counties. Some of these services are branded with a localized name, such as KirkTran (Kirksville), The Linc (Lincoln County), Old Drum Service (Warrensburg), The Bus (Sedalia), JeffCo Express (Jefferson County), Magic City Express (Moberly), and the Way 2 Go bus (Stone County). In addition, 19 towns, cities and not-for-profit organizations offer local transportation services.

Services offered vary and include local buses, intercity bus services, taxi coupon programs and paratransit (which is a service that does not follow fixed routes or schedules). The frequency of transit service in rural Missouri varies by county, but on average is two days per week.

State and local social service programs also offer transit services for riders with financial or physical needs. Assistance is offered in the form of cash reimbursements, contracts with public or private transportation providers or agency-operated transportation services



With the motto "Anyone Can Ride", SMTS provides a full range of curb-to-curb transportation services in Southeast Missouri.

Figure 3.4 - Rural Transit Service

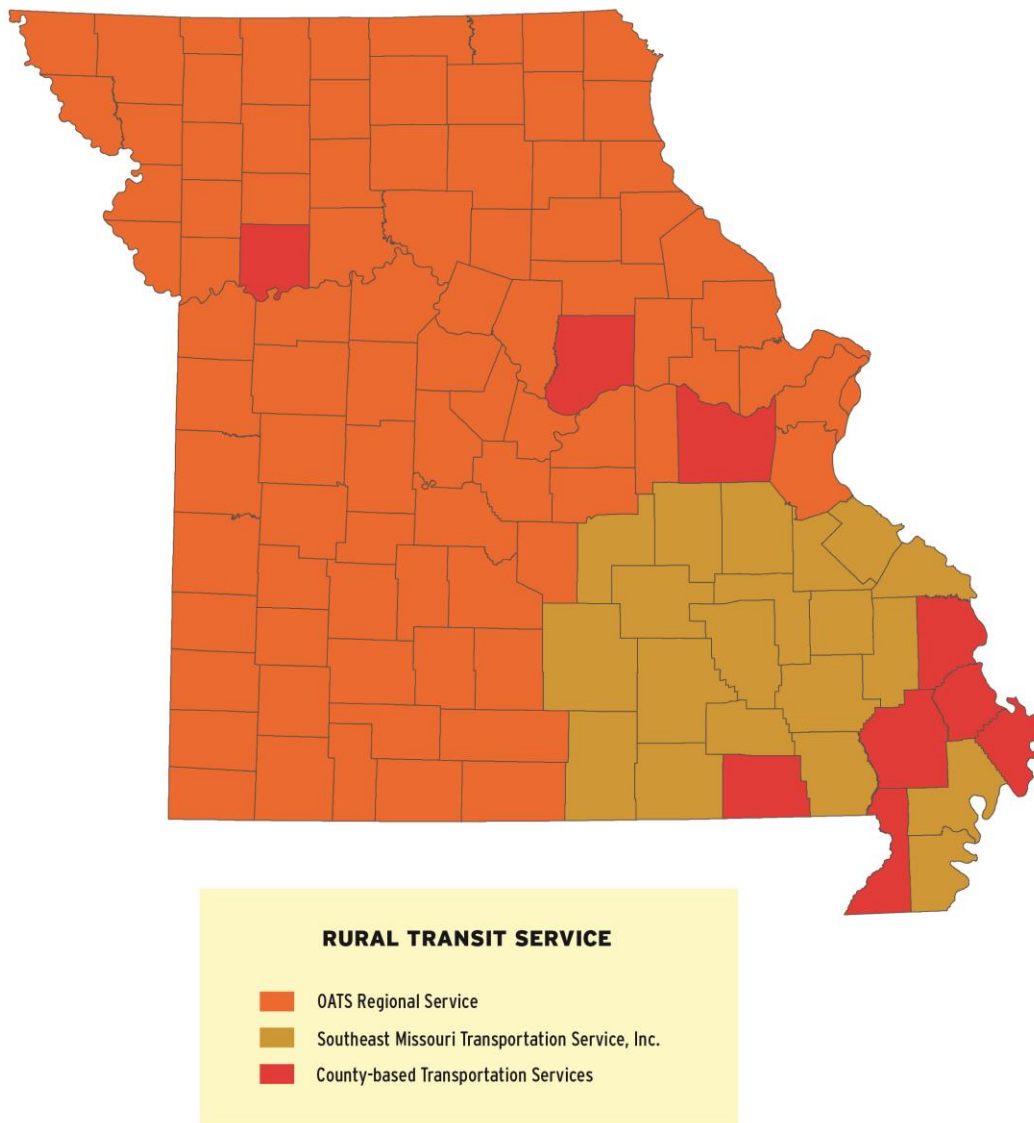
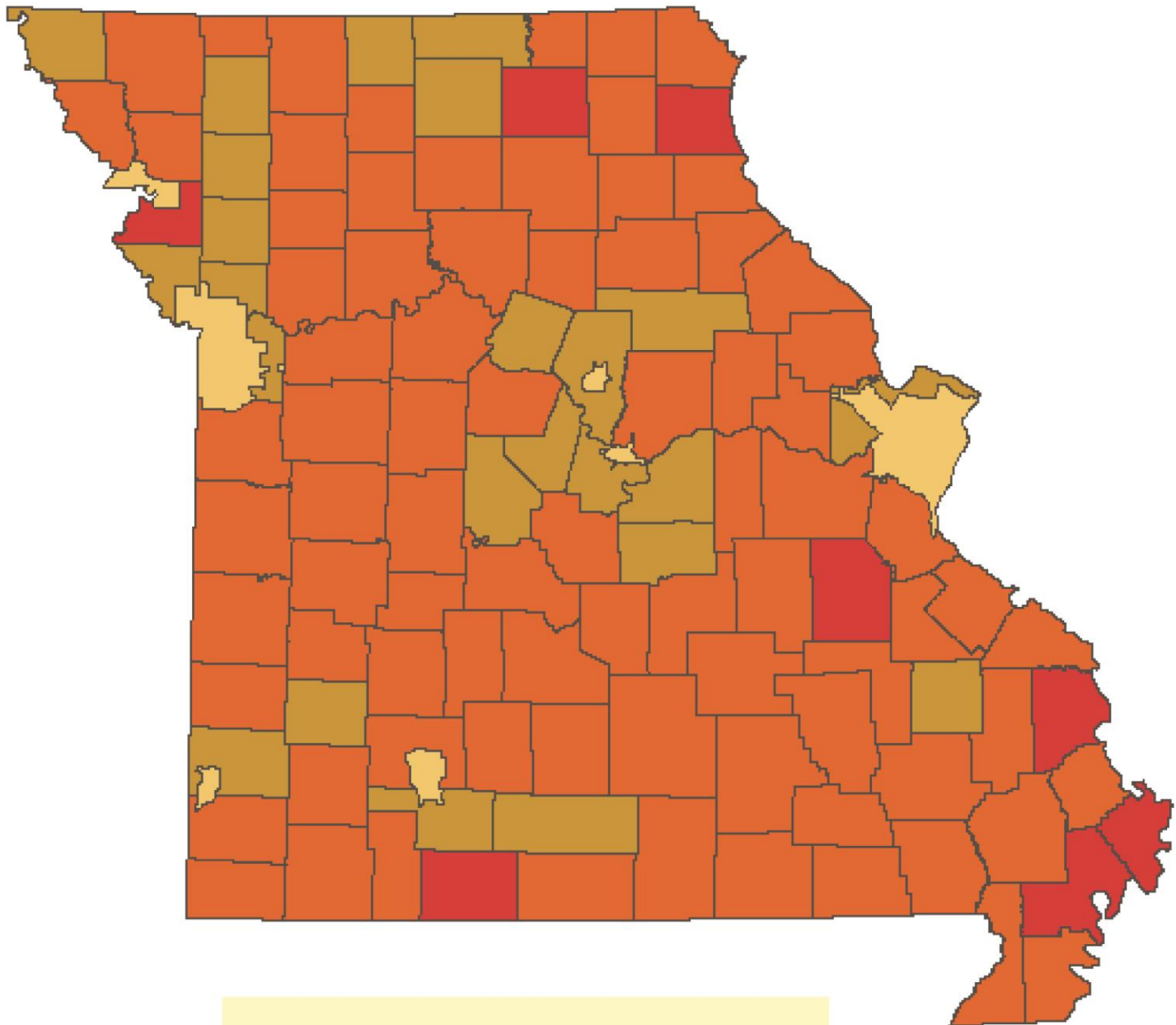


Figure 3.5 - Average Days Per Week for Rural



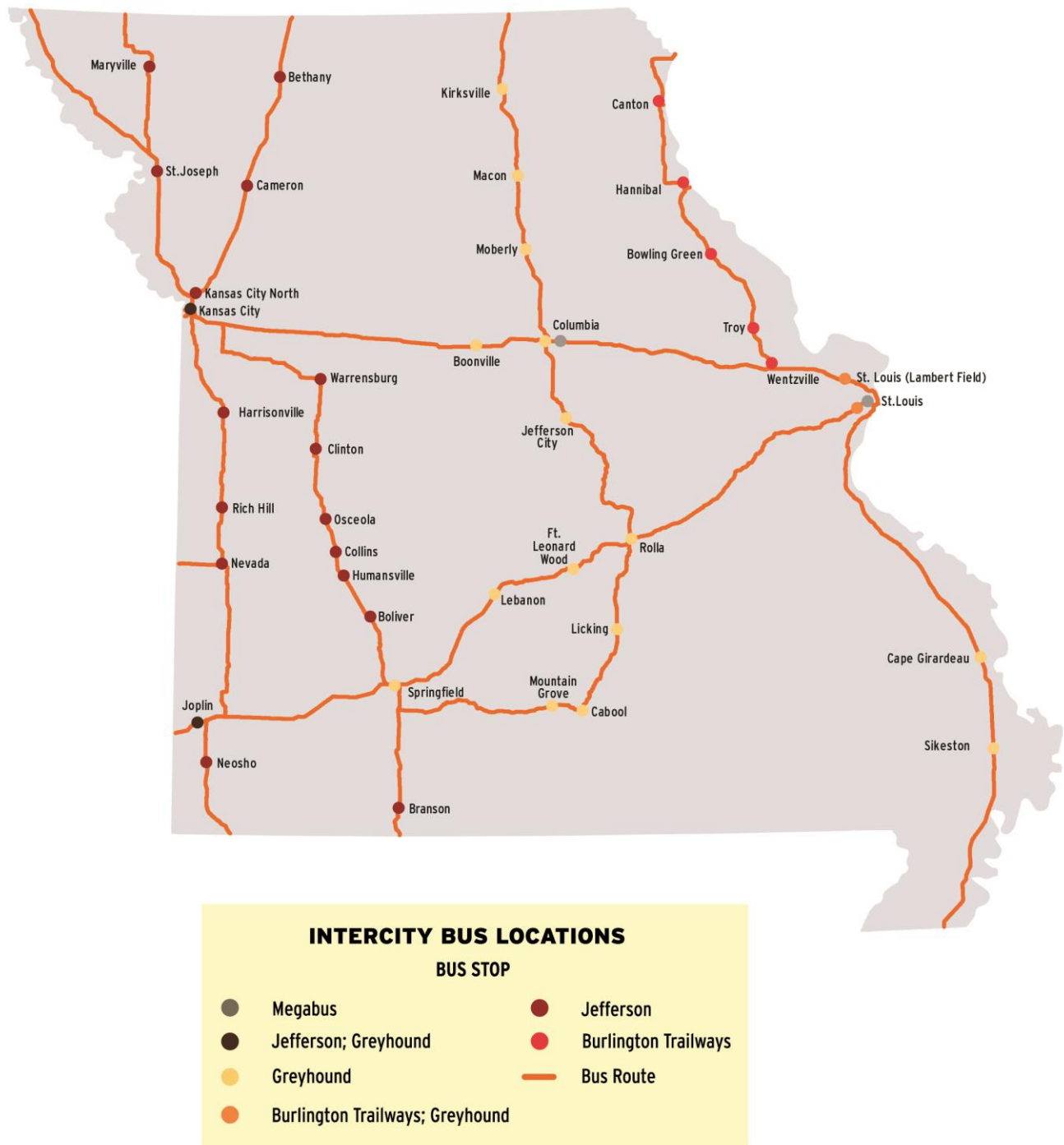
DAYS PER WEEK

- 0-1
- 2-4
- 5-7
- City Services

Intercity Bus

Missouri's intercity bus services provide a link between smaller communities and also connect those communities to larger urban areas that offer services and opportunities otherwise not available. Four intercity bus companies provide service to Missourians — Greyhound, Megabus, Burlington Trailways and Jefferson Lines.

Figure 3.6 - Intercity Bus Locations



AVIATION

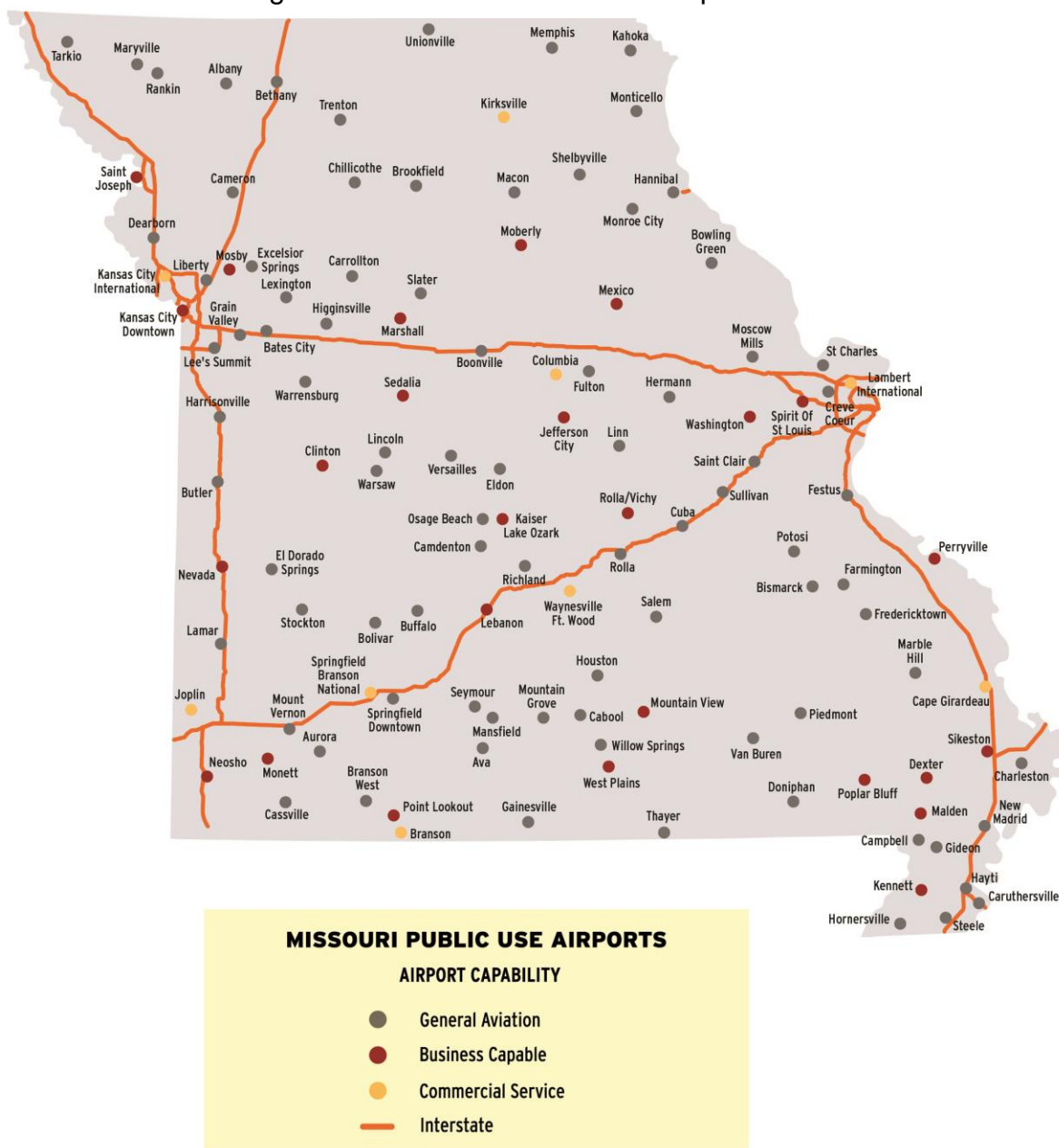
Airports play a vital role in connecting people, communities and markets. Missouri boasts nearly 500 aviation facilities, including both public and privately owned airports, heliports, seaplane bases and grass landing strips. Of those, 125 are commercial service, business capable or general aviation airports for public use.

Each year, about 12 million passengers travel through Missouri's airports. Airports also allow Missouri residents and businesses to ship and receive goods from all over the world. In 2012, 195,000 tons of freight were shipped through Missouri's airports. Moving freight by air is typically reserved for high-value and time-sensitive goods.

Keeping the state's runways in good condition is critical, and has been a focus of federal and state aviation funding in Missouri. As a result, 81 percent of the state's runway pavements were in good condition in 2012.

Missouri's 125 public-use airports are pictured in figure 3.7.

Figure 3.7 - Missouri Public Use Airports



Commercial Service Airports

Each year, nearly 12 million passengers use Missouri's nine commercial service airports, and in 2012, 81 percent of commercial flights in Missouri arrived on time. Two of the nine commercial airports — Lambert-St. Louis International and Kansas City International — offer national and international flights. Kansas City International Airport acts as a consolidation point for FedEx, UPS, Airborne, BAX Global, Emery and DHL feeder aircraft and trucks serving western Missouri and eastern Kansas. St. Louis-Lambert International Airport performs a similar function for ABX Air Inc., FedEx and UPS serving eastern Missouri and Western Illinois. Springfield-Branson National offers national service. Six more airports offer regional service — airports in Branson, Cape Girardeau, Columbia, Fort Leonard Wood, Joplin and Kirksville.



Commercial Service (Kansas City International Airport)

Business Capable Airports

In Missouri, 35 business capable airports have runways of 5,000 feet or longer. These airports, such as Jefferson City Regional pictured below, support local and regional economies by accommodating large corporate jets that provide efficient access to communities around the state.



Business Capable (Jefferson City Regional)

General Aviation Airports

The final category of public use airports are those classified as General Aviation, such as the Branson West Municipal — Emerson Field pictured below. While these airports may provide passenger service, they are more typically used by businesses and corporations and for agricultural, aeromedical, law enforcement, emergency response and recreational activities.



General Aviation (Branson West Airport)

Waterways

About 30 million tons of freight claim a Missouri port as the point of origin before being moved along the Missouri and Mississippi Rivers. Access to this transportation option is made available through 14 public port authorities in the state. Commodities transported by barge tow on the Missouri River include agricultural products, chemicals such as fertilizers and petroleum products, and manufactured goods such as building materials. The Mississippi River continues to be a major mode of transportation for a variety of farm products as well as other bulk materials such as chemicals and building materials.

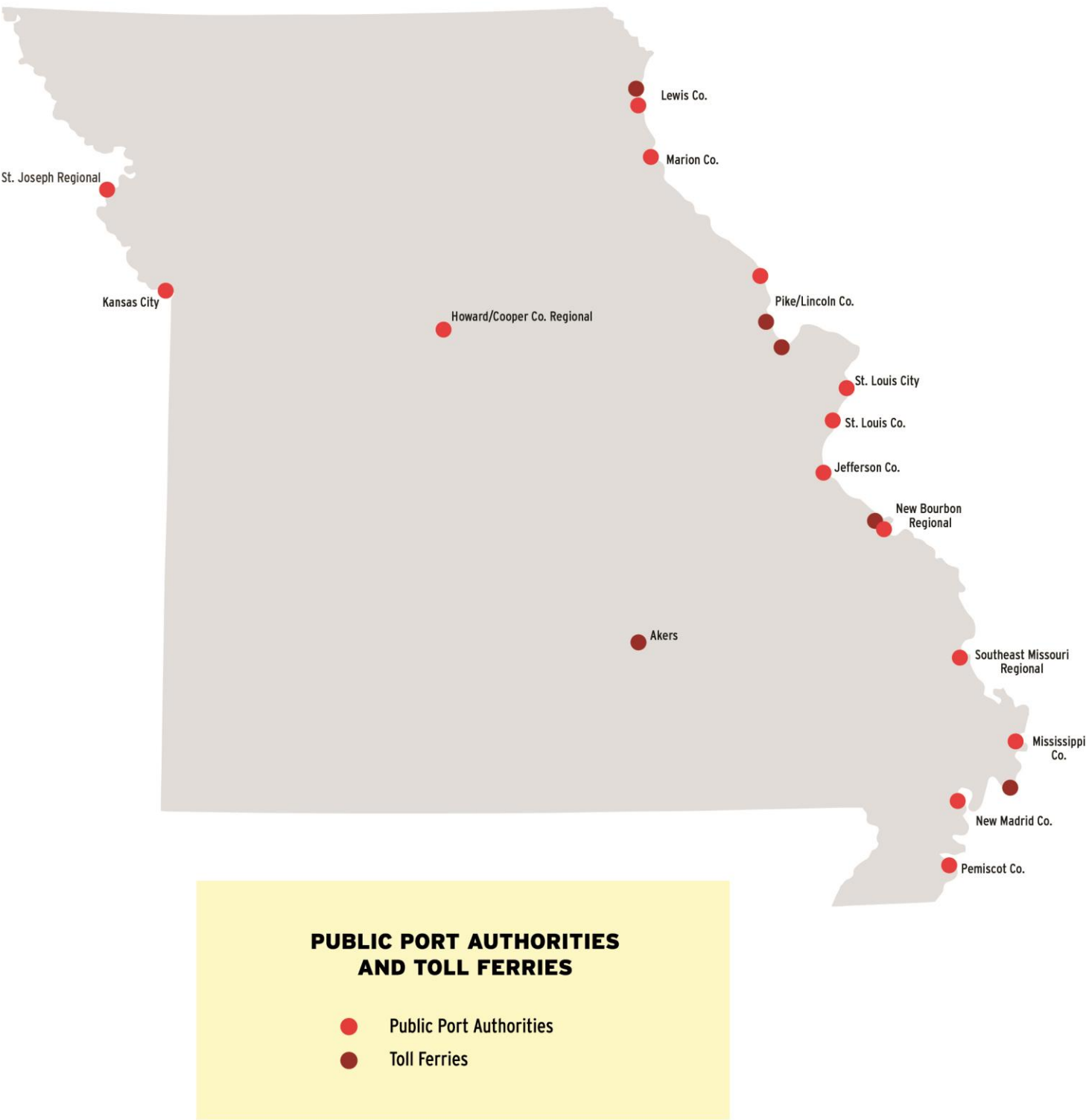
Missouri also offers six toll ferry services – five of the ferries cross the Mississippi River and one crosses the Current River.

Missouri has three nationally designated marine highways, M-29, M-55 and M-70, which shadow the interstate highway system along the Mississippi and Missouri rivers. The marine highway network has been identified to expand the use of our nation's navigable waterways to relieve landside congestion, reduce air emissions and generate other public benefits by increasing the efficiency of freight movement on the surface transportation system.



Waterway Port (Southeast Missouri Regional Port, Scott City) offers a full range of dry bulk commodity storage and shipping.

Figure 3.8 - Public Port Authorities and Toll Ferries



FREIGHT RAIL

Railroads play a major role in moving freight within and throughout the state and across the country. They also provide critical connections to the global marketplace and support a strong industry of more than 8,000 jobs statewide. In 2012, 438 million tons of freight were moved along Missouri railroads.

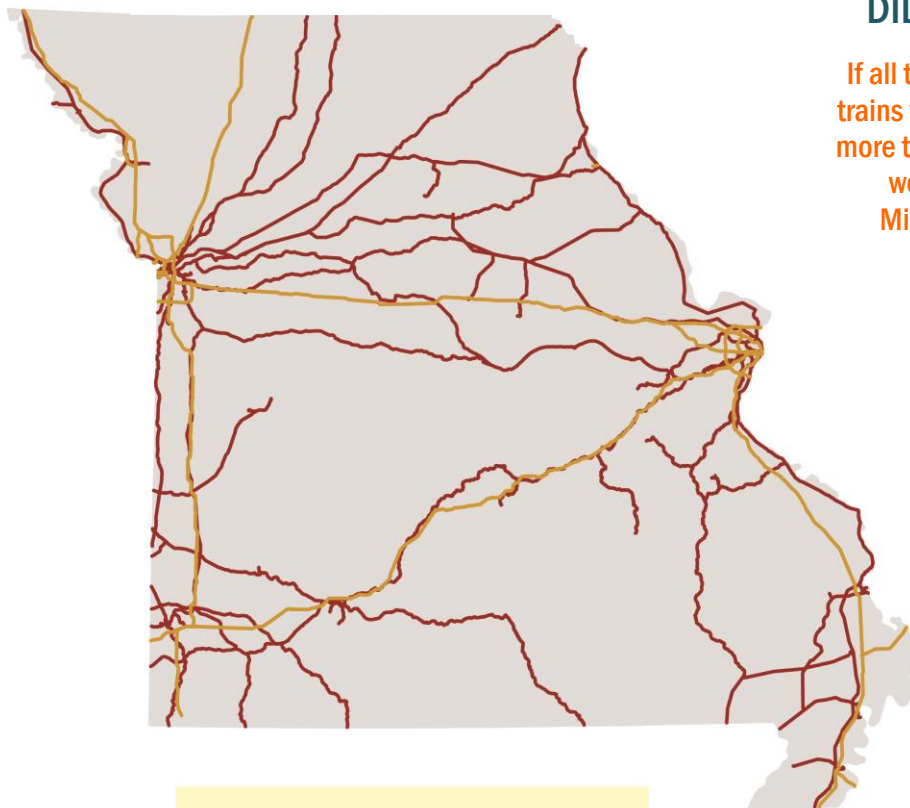
Missouri is a rail-intensive state. The second and third largest rail hubs in the nation are located in Kansas City and St. Louis, respectively, and Missouri has the 10th largest rail system with 4,822 miles of track that are owned and operated by 19 different railroad companies.



Union Pacific Train

Of the seven Class 1 railroads in the United States, six of them own tracks or have operating rights in Missouri. These include: Burlington Northern Santa Fe Railway (BNSF), CSX Transportation (CSX), Kansas City Southern Railway (KCS), Norfolk Southern Railway (NS), Soo Line Corporation (the U.S. operating arm of Canadian Pacific) and Union Pacific Railroad (UP). These Class 1 railroad companies operate 87 percent of the railroad miles in Missouri.

Figure 3.9 - Railroad Tracks



RAILROADS

- Railroad
- Interstate

DID YOU KNOW?

If all the freight carried on trains was shifted to trucks, more than 20 million trucks would be added to Missouri's highways

PASSENGER RAIL

In addition to freight moving along railroads, Amtrak operates two national passenger train routes in Missouri, providing connections to Chicago, Los Angeles and San Antonio, and a state-supported route between St. Louis and Kansas City. The state-supported route, called Missouri River Runner, also includes stops in Kirkwood, Washington, Hermann, Jefferson City, Sedalia, Warrensburg, Lee's Summit and Independence. The Missouri River Runner provides two trips each day and had an 89 percent on-time performance in 2012. Each year, about 500,000 passengers ride Amtrak trains in Missouri, which includes 200,000 on the state supported route. Passenger rail in Missouri is seen as a growing industry for business travelers, students and commuters alike. Given the expected population growth in some areas, passenger rail will continue to be an important option for travelers in Missouri.



Figure 3.10 - Passenger Rail Services



BICYCLE AND PEDESTRIAN

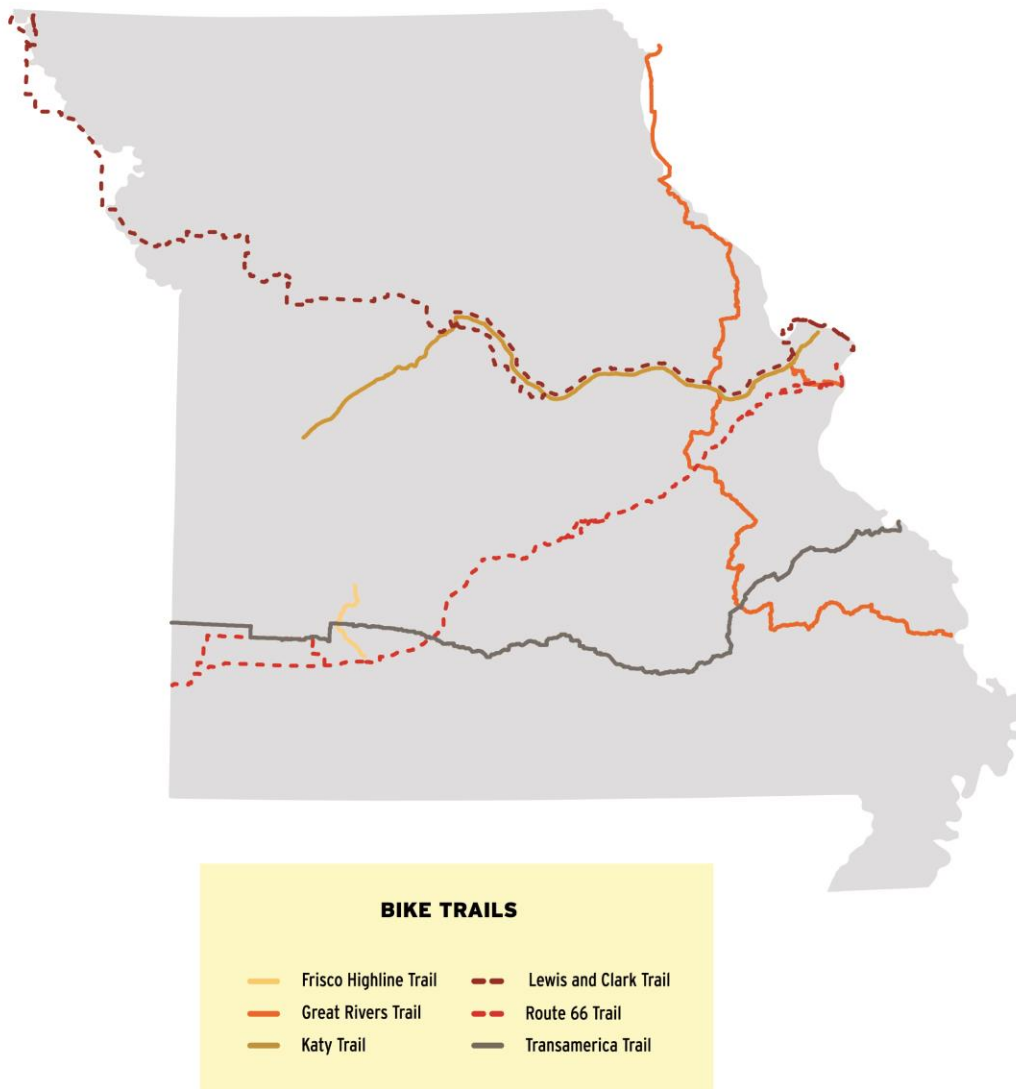
Bicycle and pedestrian facilities provide transportation options for those who cannot or choose not to drive and provide links between the various modes of transportation. These facilities are most commonly recognized as sidewalks, shoulders or lanes adjacent to cars and trucks along a road, crosswalks at signalized intersections and trail systems to name a few. Although many of these facilities are managed by cities and counties, state highways also accommodate bicyclists and pedestrians. Within the 33,700 mile system, there are many existing pedestrian facilities that need to be improved. These are identified in MoDOT's Americans with Disabilities Act Transition Plan and improvements are being added as roadway alterations are completed.



Sidewalks and paths provide important transportation options

Missouri also has six cross-state bicycle routes and about 600 miles of shared use paths. In 2011, less than 1 percent of Missouri workers age 17 or older commuted to work by bicycle and 2 percent walked.

Figure 3.11 - Missouri Bike Trails



THE SYSTEM AS A WHOLE

As previously described in the individual sections of this chapter, Missouri's transportation system is large and complex. It contains over 100,000 miles of highways and local roadways, a multitude of public transit options, thousands of miles of railway, hundreds of airports, over a dozen waterway ports and a network of sidewalks and shared-use facilities.

The size and scope of these components are each impressive, but the Missouri transportation system is greater than the sum of these individual parts. It is the connections *between* the system components, such as where bike paths connect to public transit hubs and where rail freight can be loaded onto trucks that make it especially useful. Think about a day in the life of a small business owner. Everything he or she touches has to do with the interconnectivity of our transportation system. Think about how the employees get to work or how the materials get to the producer and eventually the consumer — either here in Missouri or around the world. All of these items rely on a safe and reliable transportation system. For that reason, each transportation mode in Missouri cannot be thought of as an individual safe and reliable transportation system. Instead, each component — whether road, rail, waterway port, airport, bus, or sidewalk — must be considered part of one large and interconnected network.

THE FINANCIAL SITUATION

This section explores where transportation revenues come from, how they are allocated in Missouri and where we are headed as a state.

A DECLINING REVENUE SOURCE AND INCREASING COSTS

The majority of MoDOT's transportation funding comes from fuel taxes, which are a fixed amount for every gallon of fuel purchased. Since the 1920s, fuel taxes provided a stable funding source for maintaining and improving the transportation system, but that is not the case anymore. Fuel prices have skyrocketed in recent years, causing less driving and increasing the demand for fuel-efficient and alternative fuel vehicles. Automakers have responded by increasing the efficiency of all makes and models and are marketing that efficiency to the driving public. While these trends are great for the environment, they are bad for transportation funding because the largest transportation revenue sources are the federal and state fuel taxes.

In Missouri, the combined federal and state fuel tax rate has been 35.4 cents per gallon since 1996. Until 2005, this fuel tax provided stable growth because the number of gallons purchased increased each year. From 2005 to 2013, the number of gallons purchased in Missouri has declined 6 percent, and is projected to decline an additional 18 percent by 2035. Other sources of state revenue are available for transportation, such as motor vehicle sales taxes and vehicle licensing fees, but are not adequate to offset the declining fuel tax and to keep pace with inflation.

**WHEN GAS PRICES WERE
\$1.20/GALLON, THE FUEL
TAX WAS 35¢.**

**Now gas prices are
\$3.50/gallon, but the
fuel tax is the same 35¢**

Figure 4.1 - Fuel Taxes compared to Fuel Prices

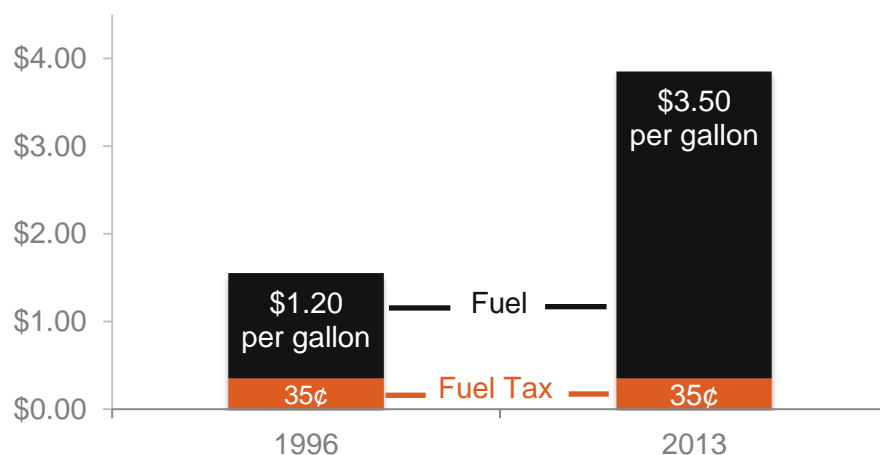
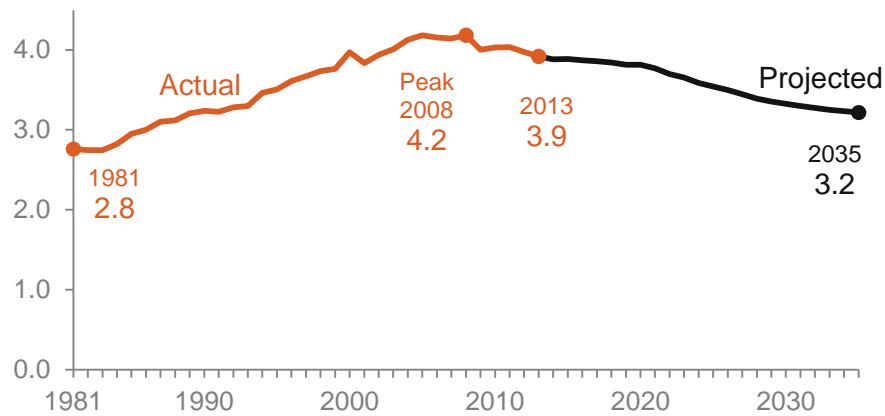


Figure 4.2 - Gallons of Fuel Taxed in Missouri
(billions)



Unfortunately, while transportation revenues are declining, the costs to maintain the transportation system and associated services have risen steadily over the last 20 years and are expected to continue increasing into the future. As shown in Table 4.1, the costs of fuel, concrete and asphalt have tripled and steel prices have doubled since 1992. The severity of these increases is stark when compared with regular inflation, which has increased by 60 percent over the same timeframe as measured by the Consumer Price Index. Because these primary cost components for transportation have increased dramatically, the costs of maintaining the transportation system have also increased dramatically when compared with many other industries and services.

Table 4.1 - COST INCREASES

	1992	2011	% Increase
Fuel (\$/gallon)	\$1.30	\$3.85	196%
Concrete (\$/cubic yard)	\$51.30	\$153.60	199%
Asphalt (\$/ton)	\$21.52	\$59.31	176%
Steel (\$/metric ton)	\$450.00	\$900.00	100%
Regular Inflation (consumer price index)	\$140.30	\$224.90	60%

WHERE THE MONEY COMES FROM

MoDOT developed a 20-year financial forecast to identify funding available for transportation investments. The forecast includes revenue projections from state taxes and fees dedicated for transportation purposes and from federal transportation funding administered by MoDOT.

Over the next 20 years, the largest source of transportation revenue, about \$15.8 billion, is expected from the federal government and mostly comes from the federal fuel tax (18.4 cents per gallon tax on gasoline and 24.4 cents per gallon tax on diesel fuel). MoDOT works with its federal partnering agencies - Federal Highway, Transit, Aviation and Rail Administrations - to administer these funds. Most federal funds are allocated for specific purposes and typically require a 20 percent state or local match. Unfortunately, federal government funding is very uncertain as the federal highway trust fund, where the federal fuel taxes are deposited, is projected to be insolvent by 2015.

The next largest source of transportation revenue over the next 20 years, approximately \$12.1 billion, is from state fuel taxes. The bulk of this source is raised through a 17 cents per gallon tax on gasoline and diesel fuel. The revenue raised from these taxes, by law, must be spent on highways and bridges. Aviation fuel is also taxed in Missouri at a separate 9 cents per gallon rate, and the revenues generated must be spent on airport improvements.

About \$8.3 billion of transportation revenues over the next 20 years are a result of the state sales taxes paid on the purchase or lease of motor vehicles. This revenue source also includes a portion of the sales tax paid on jet fuel, which is dedicated to airport improvements.

Vehicle and driver licensing fees include the revenue received from licensing motor vehicles and drivers and make up approximately \$6.6 billion of transportation revenues over the next 20 years. This revenue source also includes fees for railroad regulation. Similar to the motor fuel tax, the motor vehicle and driver licensing fees are not indexed to keep pace with inflation.

Interest and miscellaneous revenues provide approximately \$2.8 billion of transportation revenues. Interest is earned on invested cash balances, similar to a savings account. Other miscellaneous collections include construction cost reimbursements from local governments and other states; proceeds from the sale of surplus property; and fees associated with the Missouri logo-signing program, which provide the blue advertising signs on roadways that let travelers know where they can find food, lodging and fuel.

The state General Revenue fund provides approximately \$0.3 billion of transportation revenues over the next 20 years. The Missouri General Assembly appropriates these funds for rail, transit and waterway investments.

HOW THE MONEY IS DISTRIBUTED

Transportation revenue is shared among local governments, the Missouri State Highway Patrol, the Missouri Department of Revenue and MoDOT. About \$7.7 billion of state and federal funding is dedicated to local governments for transportation purposes over the next 20 years.

Missouri's Constitution allows a portion of state transportation revenues to be appropriated by the General Assembly to other state agencies. Appropriations are limited to (1) the Missouri State Highway Patrol (MSHP) to administer and enforce motor vehicle laws and (2) the Missouri Department of Revenue (DOR) to cover the costs for tax and fee collections. DOR is entitled to the actual cost of collection, not to exceed 3 percent of revenues collected. MSHP and DOR are expected to receive \$4.9 billion and \$0.4 billion of transportation revenues, respectively.

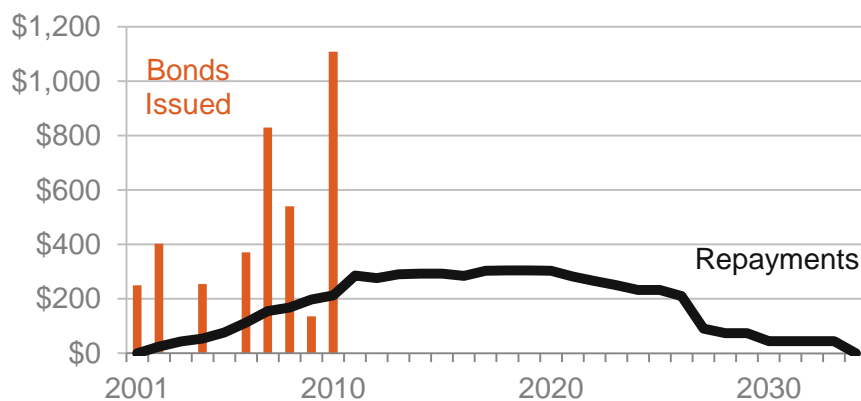
THE FUTURE OF FEDERAL

FUNDING IS **VERY UNCERTAIN**

Transportation revenues for MoDOT staff provide labor and support for operating and administering Missouri's transportation system, covering activities such as snow removal, mowing, installing and repairing signs and traffic signals, striping, and patching potholes. About \$7.2 billion of transportation revenues are estimated to be used over the next 20 years for MoDOT staff costs. MoDOT supplies and equipment are also needed to support these activities and include acquiring and maintaining MoDOT's yellow trucks, tractors, salt, supplies, traffic signals and signs across the state. MoDOT supplies and equipment total \$4.7 billion over the next 20 years.

MoDOT issued \$3.8 billion in bonds from state fiscal years 2001 to 2010. The repayment of bonds, with interest, is a fixed amount of MoDOT's budget through 2033. Bond proceeds have improved the condition of Missouri's roads and bridges, and allowed for additional improvements such as four-lane highways, new interchanges to bring businesses to Missouri, and bridges, including the new Mississippi River Bridge in St. Louis and the I-29/35 bridge in Kansas City. Bonding allows the traveling public to start enjoying the improvements now rather than waiting until funding is saved to pay for the projects. The interest cost for bonding is offset by saving on future inflationary cost increases. The repayment of bonds is approximately \$3.7 billion over the next 20 years.

Figure 4.3 - MHTC Annual Bond Financing Summary (millions)



Transportation investments are projected to receive \$17.3 billion of transportation revenues over the next 20 years. The majority of the transportation investment budget must be spent, by state law, on roads and bridges. Based on the estimated \$17.3 billion of transportation investments, about \$15.8 billion, or 91 percent, will be available for roads and bridges over the next 20 years while the remaining \$1.5 billion, or 9 percent, will be available for transit, aviation, rail and waterways investment categories. Most transportation investment funding is provided by federal revenues, which are highly uncertain over the next 20 years.

The \$17.3 billion amount available does not include all of the funding used on transportation in the state. It does not include local taxes, such as a city sales tax dedicated for transportation purposes; federal funding that is sent directly to transportation providers; or passenger fares. Road and bridge funding is largely payments to contractors to construct improvements to the state highway system, but also includes costs for engineering, right of way land purchases, and utility relocations. Transit funding includes MoDOT administered funds to support rural, urban and specialized transit providers across the state. Aviation funding includes maintenance and capital improvement funds for the state's publicly-owned, public use airports. Rail funding includes state assistance for the passenger rail service between St. Louis and Kansas City and safety improvements for highway-rail crossings. Waterways funding is primarily capital improvements for ports, but also includes operating support for ports and ferry boats.

LESS TO SPEND THAN IN THE PAST

The \$17.3 billion projected to be available for transportation investments over the next 20 years is based on funding levels significantly less than recent years. In 2009, transportation investments totaled \$1.8 billion, primarily from Amendment 3 bond proceeds and the American Recovery and Reinvestment Act of 2009. In 2013, \$1.0 billion was available and that number will shrink to \$0.6 billion by 2019. The largest decline within the transportation investments will be for highway construction contracts, which were \$1.3 billion in 2009, \$746 million in 2013, and projected to be \$425 million by 2019.

Funding projections are based on key assumptions that are reviewed and updated at least once per year. Projections may be updated more frequently, if needed. **Some major assumptions for the long range plan funding projections include:**

- Federal revenues will remain constant with 2013 funding levels and match requirements. **Future federal funding is very uncertain and the federal Highway Trust Fund is currently projected to be bankrupt in 2015.** MoDOT will continue to evaluate the federal funding assumptions as new information becomes available. Any reduction in federal funds will significantly reduce funding available for the 20 year financial forecast.
- State revenue projections are based on future economic estimates provided by the U.S. Department of Energy, which results in declining fuel tax revenues and only modest growth in other revenue sources.

Not only are transportation revenues declining, but the costs of transportation improvements are forecasted to increase each year. These increases are similar to the forecasted increases in costs for food, health care, housing/rent, movie tickets, sporting events and so forth. Whether the transportation improvement is replacing a bridge, resurfacing a road, purchasing a transit bus, replacing runway pavement, or adding sidewalks, costs are increasing. In addition to rising costs, new “necessities” such as cell phones, cable/satellite TV and internet service have become part of our daily lives. It is a similar story with transportation - over time, transportation improvement costs have increased due to increased regulations, revised policies and improvements needed for public safety, and increased labor and equipment costs. Examples of new costs include increased erosion control measures while building new roads, improved earthquake design requirements for bridge safety, new federal specifications for airport projects, transit bus features and improved work zone designs for the safety of both the public and workers.

The overall general upward price movement of goods and services in an economy is termed “inflation.” For transportation improvements, MoDOT looks for ways to minimize, mitigate and manage these increased costs over time by using innovative approaches during the design and construction phases of projects and increasing competition among project bidders. These approaches allow MoDOT to complete as many improvements as possible.

WE HAVE CHOICES TO MAKE

A declining transportation funding mechanism combined with a growing list of needs and inflationary costs is the biggest challenge facing Missouri’s transportation future. A tremendous gap exists between the funds available and the large list of transportation wants, needs and projects we have heard from Missourians. Each year the gap grows larger as fuel tax receipts decline and the purchasing power of each dollar diminishes as goods and services cost more due to inflation. Meanwhile, the transportation wants, needs and projects from Missourians continue to grow.

MoDOT has already cut internal costs and services to maximize the amount of funds dedicated to achieving Missouri’s transportation vision. MoDOT has committed to saving \$512 million in operating costs from 2011 through 2015, and an additional \$117 million each year thereafter. These savings were from a 20 percent staffing reduction, along with reductions in

facilities and equipment. Unfortunately, Missouri cannot simply cut its way to an improved transportation system.

DURING ON THE MOVE, MISSOURIANS AGREED THAT CURRENT

FUNDING IS INADEQUATE TO DELIVER THE TRANSPORTATION

These facts mean Missourians have some tough choices ahead of them. They rely on a modern and safe transportation system to get to work, school and everywhere in between. A healthy transportation infrastructure ensures businesses can operate and grow. It ensures the state can prosper and jobs can be created. Essentially, transportation is what keeps Missouri moving. Missourians recognize that investments in transportation are part of the solution for the state's growth and prosperity.

Additional funding is needed to make significant strides in achieving Missouri's transportation vision. Missourians have identified over \$70 billion in wants, needs and projects to date, which are summarized in Table 4.2 (see Appendix L for more detailed information). Unfortunately, only \$17.3 billion of available funds are expected over the next 20 years. In addition to increased funding, greater flexibility to invest the funds across the various transportation options is needed.

**Table 4.2 – WANTS, NEEDS AND PROJECTS
IDENTIFIED DURING ON THE MOVE:
DISTRICT/STATEWIDE TOTALS by TYPE/MODE (\$ millions)**

District	Total	Aviation	Bike/Ped	Highways & Bridges	Rail	Transit	Waterways
Northwest	\$2,967	\$15	\$92	\$2,387	\$77	\$382	\$14
Northeast	\$2,802	\$24	\$138	\$2,222	\$248	\$158	\$12
Kansas City	\$10,574	\$521	\$665	\$6,992	\$121	\$2,249	\$26
Central	\$6,729	\$56	\$50	\$4,819	\$157	\$1,643	\$4
St. Louis	\$13,766	\$103	\$342	\$9,130	\$308	\$3,755	\$128
Southeast	\$5,211	\$26	\$95	\$4,371	\$100	\$310	\$309
Southwest	\$11,887	\$40	\$246	\$7,234	\$3,375	\$992	\$0
Statewide	\$17,708	\$820	\$235	\$10,273	\$3,919	\$1,390	\$1,071
Total	\$71,644	\$1,605	\$1,863	\$47,428	\$8,305	\$10,879	\$1,564

Costs shown in 2013 dollars. Costs are expected to increase three percent per year due to inflation.

The transportation wants, needs and projects of Missouri are large and Table 4.3 illustrates how much it costs to provide improvements and how much components cost. The costs can vary widely across the state due to such things as terrain, geology, availability of raw materials, labor availability and agency standards.

TABLE 4.3 - TYPICAL COSTS FOR TRANSPORTATION IMPROVEMENTS (2013 dollars)*

Type of Improvement/Component	Cost
Thin pavement sealing	\$20,000 / mile
Thin minor road resurfacing	\$50,000 / mile
Thin major road resurfacing	\$300,000 / mile
Thin interstate resurfacing	\$325,000 / mile
New two-lane road	\$1.8 million / mile
New four-lane road	\$5 million / mile
New shared four-lane	\$2.2 million / mile
New sidewalk	\$100 – \$200 / foot
Small bridge replacement	\$700,000
Bridge deck replacement	\$300,000
Major river bridge replacement	\$50 – \$100 million
Light rail	\$60 – \$90 million / mile
Streetcar	\$50 million / mile
Construct guard cable	\$100,000 / mile
New interchange	\$10 million
Bus rapid transit	\$35 million / route
Large transit bus	\$300,000
Rural transit bus	\$100,000
Railroad lights and gates	\$250,000
Add narrow shoulder to minor road	\$150,000 – \$200,000 / mile
Pave a county gravel road	\$300,000 / mile

** The amounts represent upfront costs only and do not include ongoing operating and maintenance costs*

LISTENING TO MISSOURIANS

Throughout On the Move, MoDOT traveled to all 114 counties in the state to hear what Missourians want from their transportation system. We received an incredible amount of feedback that is reflected throughout this plan.

In 2013, MoDOT embarked on an unprecedented, comprehensive community engagement initiative called On the Move. MoDOT representatives visited every county in the state to gather direction and insights from Missourians on major transportation issues and priorities. To date, over 12,000 suggestions have been received, including big picture ideas and requests for localized projects.

Reaching out to Missourians to determine their thoughts and priorities about the state's transportation system is the right thing to do. As a responsible steward of taxpayer dollars, MoDOT needs to know what Missourians think of the current transportation system and what they expect in the future. That input has directly shaped the development of this long term transportation plan.



ENGAGEMENT OPPORTUNITIES

MoDOT used three primary mechanisms to engage with citizens, stakeholders and policymakers regarding the future of the state's transportation system. Those mechanisms included a Mobile Tour, Listening Sessions and virtual forums. A description of each mechanism and a summary of the key themes are provided below.

Mobile Tour Visits Every County

Through a never-done-before Mobile Tour outreach approach, citizens from across the state were asked to participate in a conversation about our state's transportation future. From April to July 2013, bright orange On the Move vehicles visited local fairs and festivals, sporting

events, diners, truck stops, convenience stores and more. MoDOT representatives traveled a total of 25,225 miles and made stops in every county to talk with Missourians about transportation issues and projects.

In addition to informal discussions, residents completed a simple two-question survey and were also encouraged to visit the On the Move website. A list of stops made and every community visited can be found in Appendices A to H.

Listening Sessions Engage Missourians on Transportation Issues

MoDOT conducted 17 Listening Sessions across the state and asked interested citizens, stakeholders and policymakers to participate in focused discussions about Missouri's transportation future. Nearly 600 Missourians reflecting a cross section of the state participated in these discussions, including:

- Thirty-five participants represented traditionally underserved segments of the population including the NAACP or Community Resource Council.
- Eighty-one participants were advocates for a specific transportation option.
- One hundred twenty-six participants were state or federal elected officials or members of the general public, safety groups, the K-12 or higher education community, or environmental groups.
- One hundred thirty-five participants were MoDOT's planning partners including representatives from cities, counties, regional planning commissions and metropolitan planning organizations.
- One hundred eighty-seven participants represented the business community including individuals from chambers of commerce, other economic development organizations and engineering and contracting groups.

During the Listening Sessions, participants were asked to consider top priorities and challenges to the state (and MoDOT) under two funding scenarios. The first scenario was based on the existing annual funding, and the second scenario included additional funds. The majority of participants in every Listening Session found the current funding amount to be inadequate to deliver the transportation system Missouri needs today and in the future.

Virtual Forums & Additional Feedback Mechanisms Bring More Missourians into the Conversation

Missourians were also encouraged to visit MoDOT's On the Move website to weigh in with their thoughts on transportation issues. Feedback was provided on important big picture transportation issues and specific project suggestions through a two-question survey and project suggestion forms. Nearly half of the 12,000 comments submitted to MoDOT during the On the Move effort were submitted via the project website.

Suggestions have also come from MoDOT's general website, customer service phone line, discussions at open houses, through the Planning Framework process, local government discussions and many other ways.

ON THE MOVE OVERALL THEMES

During the course of the six-month engagement initiative, several key themes emerged. Many of these themes are not new — Missourians are practical and have always placed high value on keeping highways and bridges safe and in good condition. But some of the themes have grown in importance — such as an increasing the desire to have more transportation system choices and to focus more on the economic impact of transportation investments.

MOBILE TOUR BY THE NUMBERS

**MORE THAN
25,225 MILES TRAVELED**

**More than
230 communities visited**

**All 114 counties in the state
were visited**



Taken together, these themes shape the transportation vision for the state of Missouri and inform how MoDOT will deliver transportation programs and projects in the coming years:

- Maintenance of the current system should be a top priority.
- All forms of transportation should be safe for citizens, and safety improvements should be a priority.
- More transportation choices are needed to move both people and freight throughout the state more efficiently.
- Whenever possible, upgrades to the current system should deliver economic development opportunities to the community.
- The current transportation system is large and MoDOT should explore ways to team with local governments and other partners to better leverage the taxpayers' investment.
- Current funding is unacceptable. Opportunities will be lost and the current system cannot be maintained at an acceptable level unless funding increases. Missourians are keeping an eye on this issue and many have thoughts on alternative funding mechanisms.
- Missourians appreciated the opportunity to be involved in crafting their state's transportation future.
- Missourians want MoDOT to be held accountable for the effective use of tax dollars, for the quality of work done on projects and for communicating with the public.

In addition to these overarching themes, Missourians have identified an incredible amount of projects and needs through On the Move and other MoDOT outreach efforts. See Appendix L for a list of transportation wants, needs and projects suggested through On the Move.

MISSOURI'S FOUR TRANSPORTATION GOALS

Our vision was formed by conversations with thousands of Missourians. As we outline a realistic path to success, we have developed specific strategies to move Missouri closer to achieving each of these four goals:

- Take care of the transportation system and services we enjoy today
 - Keep all travelers safe, no matter the mode of transportation
 - Give Missourians better transportation choices
 - Invest in projects that spur economic growth and create jobs
-

Each of these four goals is important to Missouri's transportation success, but each is also intimately related to the others. A well-maintained system is safer to travel and means less injuries or fatalities. A safer system means more options for travelers. More options mean a more efficient system that better supports economic growth.

The sections that follow outline each of the four goals and the strategies that will help Missouri achieve its transportation vision.

GOAL: TAKE CARE OF THE TRANSPORTATION SYSTEM AND SERVICES WE ENJOY TODAY

The transportation system is critical to the quality of life in Missouri. It has been built, improved and maintained over the past century with a steady commitment of the state's resources. Protecting this past investment requires a commitment to preserve and maintain these valuable transportation assets. Throughout *On the Move*, Missourians consistently recognized the importance of maintaining the system so that it can continue to serve the state's people, businesses and economy.

Much like a house or a car requires upkeep and maintenance, Missouri's roads, bridges, trains and buses require regular care if they are to last. Regular maintenance also makes good budgetary sense — it is far cheaper to maintain a road or bridge in good condition than it is to repair or replace that road or bridge once it falls into poor condition. A well-maintained system also saves people and businesses money by making vehicles less expensive to operate.

Unfortunately, the costs to maintain the transportation system and associated services have risen steadily over the last 20 years and are expected to continue increasing into the future. But rising costs do not mean that Missourians are willing to compromise on system maintenance and preservation. Residents have continued to put a priority on maintaining the

**MISSOURIANS
EMPHASIZED THEY
EXPECT MODOT,
FIRST AND
FOREMOST, TO TAKE
CARE OF THE
EXISTING SYSTEM.**

current conditions and performance of the transportation system. Each of the transportation options has unique resource needs if current conditions and service levels are to be maintained.

Highway Pavement and Bridge Conditions

The condition of some of Missouri's state highways and bridges has improved in recent years because of a conscious effort by MoDOT to focus its limited resources on the roadways that affect the most people every day. While progress has been made statewide over the past several years to make roads smoother and safer, anyone who travels around the state knows that there are many areas that need to be fixed. Based on current revenue projections the problem will only get worse. Many of the improvements that occurred over the past decade, made possible by temporary funding from Amendment 3 and federal dollars, demonstrated that MoDOT can successfully focus on and fix the areas of highest concern. However, addressing our maintenance priorities through temporary funding options is over, stalling MoDOT's ability to get more roads and bridges into safe condition.

This improvement is the result of a strong financial investment of MoDOT resources. Amendment 3 bond funds which became available in 2004 enhanced MoDOT's ability to improve the condition of roads and bridges. In 2009, the Safe and Sound Program provided funds for improvement of 802 bridges. In 2009, the American Recovery and Reinvestment Act provided additional funds for road and bridge improvement projects. All of these programs helped achieve the road and bridge conditions of today.

The improvement in road and bridge conditions was also a result of strategic MoDOT policies. A practical design philosophy was implemented to construct only what was needed and no more. For pavement, the strategy was to apply the thinnest treatments possible while providing six to ten years of good condition. This strategy resulted in more of the system being improved because a thin preventive maintenance treatment is a lower cost solution than removal and reconstruction of existing pavement.

A decision was also made to focus on the most heavily traveled roads. While this strategy provided the greatest impact to the largest number of travelers, maintenance of lesser-traveled roads is also important and we've heard from Missourians that minor road conditions need to be improved. In 2012, one-third of Missouri's minor highways were rated in fair or poor condition.

In addition to roads, the state highway system contains over 10,000 bridges of varying sizes, and keeping them safe and well maintained is vital. The condition of the state's bridges has steadily increased over the last decade, improving from 69 percent in good condition in 2001 to 80 percent in 2012.

Included in the bridge count are 211 major bridges that are over 1,000 feet in length. Even though they represent only 2 percent of the total number of bridges, they make up 25 percent of bridge deck area and are a key component of the state's infrastructure. There are about 450 one-lane bridges in the state, most of which are restricted to one lane due to their poor condition.

Keeping Highway Pavement and Bridges in Good Condition Requires a Commitment of Resources

The annual costs to maintain the state's highways and bridges in their current condition are significant today, and are expected to grow in the future. Predicting the future costs to keep the highways in good condition involves estimating the type of treatment work that will be needed for each bridge and roadway, when those treatments will be needed, and how long those treatments will be effective. The effective life of a pavement is most commonly impacted by the traffic volume, preventive maintenance activities, ground support and quality of the materials used in the pavement. In addition, the level of "good" impacts how much of the system needs to be kept good. Currently in Missouri, the goal for major roads is to maintain 85 percent of pavements in good condition.

MAINTAINING MISSOURI'S EXISTING TRANSPORTATION SYSTEM AND SERVICES IS

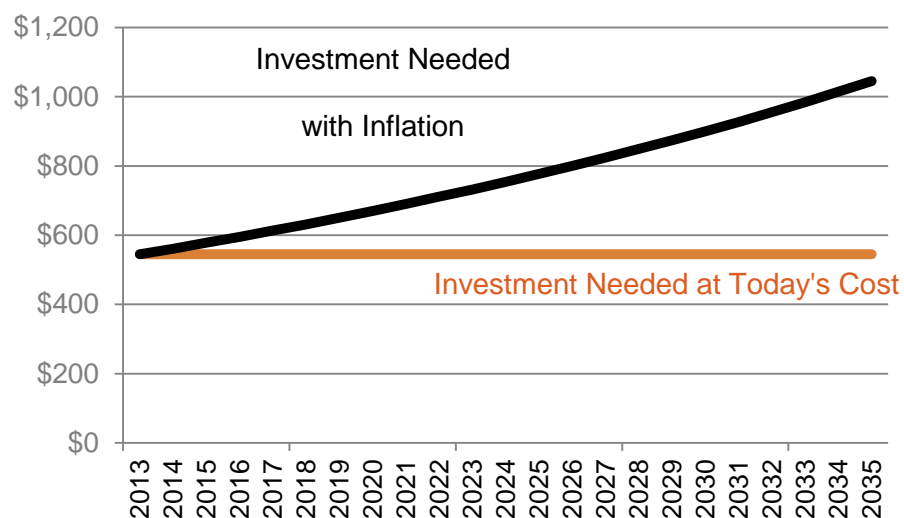
essential to creating a
foundation for making
progress toward
Missouri's transportation
vision.

Table 6.1 - COSTS TO MAINTAIN HIGHWAYS IN CURRENT CONDITION
(\$ millions)

Highway System Component	Good Condition Percentage Today	Annual Cost to Maintain Today	Annual Cost to Maintain in 2035 (with 3 percent Inflation)
Major Highways	89%	\$250	\$480
Minor Highways	69%	\$110	\$210
Bridges	80%	\$185	\$355
TOTAL		\$545	\$1,045

A comparison of these costs with the projected available funding (as provided in Chapter 4: The Financial Situation) warns of a challenging path ahead. Assuming an inflationary increase of 3 percent per year, the current projected available funding will not be sufficient to maintain the highways and bridges in their existing conditions after 2019, as illustrated in Figure 6.1.

Figure 6.1 – Maintaining Existing Highway and Bridge Conditions



Local Roadways are Maintained by Local Governments

The local road system makes up another large and important part of Missouri's transportation system. Collectively, the system consists of over 96,000 miles of county roads and city streets and almost 14,000 bridges. These local roads are preserved and maintained by city and county governments. As a supplement to local taxes and fees, they receive \$133 million annually in federal highway funds administered by MoDOT and an additional \$246 million per year in dedicated state highway user taxes and fees.

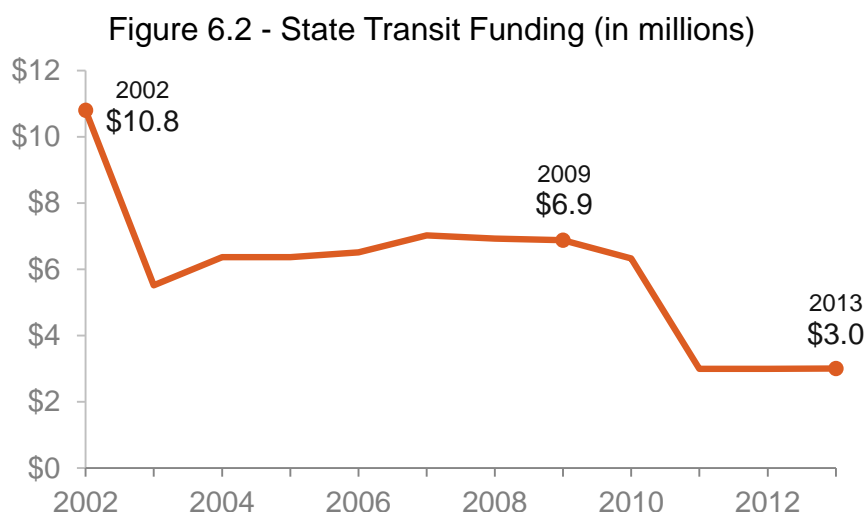
The State Role in Maintaining Transit Service Could Increase

There are over 2,800 transit vehicles that operate and rely on Missouri roads to provide over 68 million trips each year. Although it's important to have roads and bridges in good condition for these trips, maintaining the funding for vehicles, staffing and operating costs is also essential.

Transit services in Missouri range from seven-days-a-week, multiple route city bus systems in large cities to rural services that operate just once a week or a few times a month. MoDOT currently administers \$24 million in federal and \$3 million in state funding to support transit services. This \$3 million in state revenues provides less than 1 percent of the total funding for transit services in Missouri. The majority of revenues come from local sources including local governments and fare revenues from passengers.

As fuel and other costs increase into the future, this level of funding won't be sufficient to maintain existing service levels and will not adequately replace the many buses that are already operating beyond their intended useful life, further increasing the maintenance and operating costs. Many rural transit providers have recently started transitioning from a suggested donation ridership cost to a defined cost to ride. These and other changes will be necessary in the future just to maintain the current level of service.

**STATE FUNDING FOR
TRANSIT SERVICE
HAS DECLINED
DRAMATICALLY
SINCE 2002**



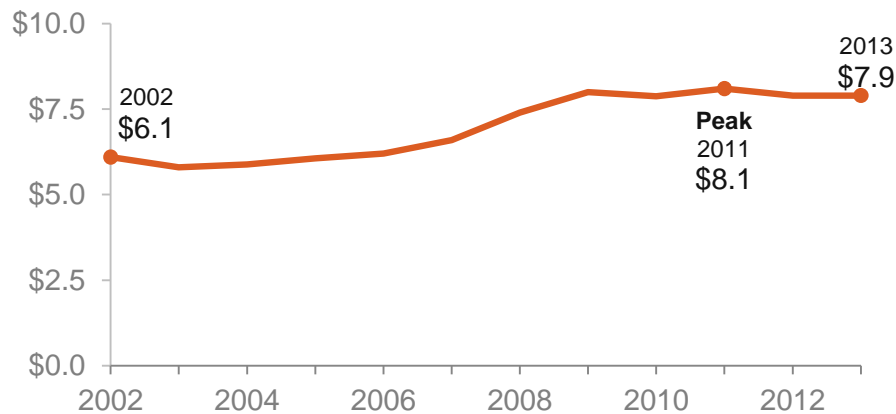
Passenger Rail Services Have Increased

In recent years, MoDOT has received \$8 million to \$9 million a year from the state's general revenue fund to support passenger rail in Missouri. These funds support the Amtrak (Missouri River Runner) passenger rail service, operating between St. Louis and Kansas City with two round trips per day. State funding has increased from \$6.1 million in 2002 to today's amount. No federal operating assistance is used to support the service.

Investments have been made along the route in recent years and have improved on-time performance from 63 percent in 2008 to almost 90 percent today. It's no coincidence that Amtrak's ridership is up 74 percent during this time. Customer satisfaction has also increased from 68 percent to 89 percent, which is the seventh highest ranking among all Amtrak routes in the nation. Each year, about 200,000 riders use this service and costs to maintain the current service will continue to grow over time.

Two additional national Amtrak passenger services operate on a rail line that links Los Angeles to Chicago with stops in Kansas City and La Plata, Missouri, and Chicago to San Antonio with stops in St. Louis and Poplar Bluff. Neither route receives state funding, but each receives direct federal operating assistance.

Figure 6.3 - State Amtrak Funding for Service from St. Louis to Kansas City (in millions)



Airport Runways Will Be Challenging to Maintain

Missouri's aviation network consists of nearly 500 facilities of which 125 support daily public use. A portion of the \$20 million of federal and \$5 million of state funding administered through MoDOT is used to maintain the existing facilities at these airports. Currently, 81 percent of runways are in good condition. In the coming years, however, as inflationary influences increase, the existing runway conditions will be challenging to maintain at the current level of funding.

Waterways are Also Supported by the State

Missouri's 14 waterway ports move large volumes of freight in and out of Missouri. Keys to port viability include capital investments, but well maintained port facilities and other transportation links like roads and railroads are also essential. State support for waterways currently consists of \$375,000 for port operating assistance and \$176,000 in operating support for two of the six ferry boats that operate in Missouri. Additionally, in fiscal year 2014, the state approved \$3 million of general fund revenue for port capital improvements. Unless a dedicated source can be identified, any future capital funding will depend on annual legislative approval. Federal funds are not available for waterway funding.

Strategies to Move Forward

Missourians depend on our transportation system every day. To keep it at today's level, it will take hard work and more resources. The following strategies are designed to achieve the transportation system that Missourians desire. The challenge is that collectively, there will not be enough financial resources in the near future to keep the system in good condition and continue providing services that are currently in place.

1. **Establishing condition and service goals for all components of Missouri's transportation system** — including roads, bridges, airports, ports, transit, rail, sidewalks and trails. This includes identifying the current condition and level of service for each mode of Missouri's transportation system and determining the condition and level of service Missourians expect. MoDOT's performance measurement system, "Tracker," currently measures some of these areas, but would need to be expanded to include all modes of transportation.
2. **Securing dependable funding to support the current system and services for all modes of transportation.** Roads and bridges are primarily funded with dedicated federal and state fuel taxes, which have not kept up with the cost of inflation and are projected to decline in future years. The majority of funding for non-highway

transportation modes does not have a dedicated source of yearly funding that make long-term improvements possible.

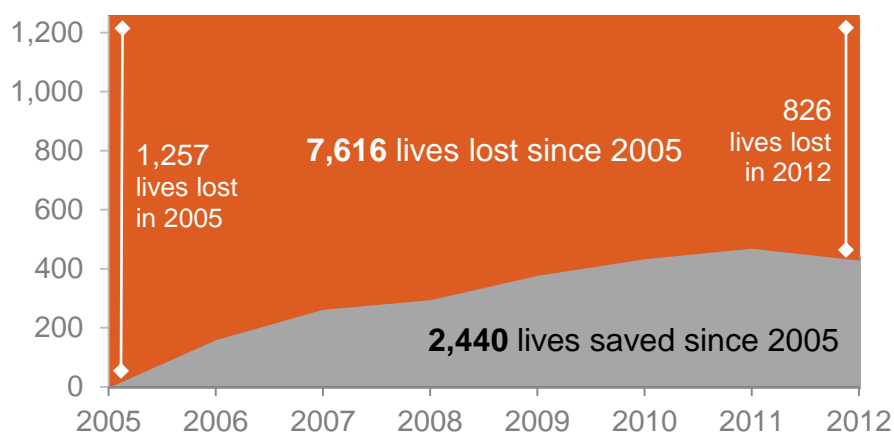
3. **Continuing to explore technology and developing business practices that result in lower costs to stretch funding for more improvements.** MoDOT and transportation providers must be bold, while practical, in their approach to trying innovative solutions to deliver more transportation improvements with funding available. This includes embracing new approaches from contractors and other transportation partners.

GOAL: KEEP ALL TRAVELERS SAFE, NO MATTER THE MODE OF TRANSPORTATION

MoDOT believes that even one transportation-related death on our system is unacceptable and has a **Zero Lives Lost** goal. This approach means Missourians should be safe and secure no matter how they choose to travel — whether by car, bus, train, airplane, bicycle, wheelchair or walking.

The good news is that Missouri's transportation system is getting safer. Since 2005, traffic fatalities and serious injuries have declined significantly — it is estimated that 2,440 people are alive today because of a safer transportation system. These results were achieved due to leadership actions by Missouri's Coalition for Roadway Safety (SaveMoLives.com) that formed in 2004. The coalition includes law enforcement agencies, health care providers, courts, government agencies, advocacy groups, planning organizations and concerned citizens that banded together to help loved ones come home safe every day.

Figure 6.4 - Lives Saved and Lives Lost (2005-2012)



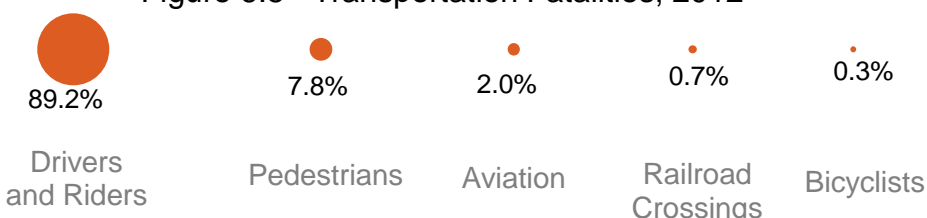
The coalition produces Missouri's Blueprint to Save More Lives that establishes specific goals and strategies to reduce the number of fatalities and serious injuries on Missouri roads. Their efforts have resulted in safety improvements on Missouri roadways, focused enforcement efforts and educational campaigns that promote transportation safety.

How Lives are Lost

Although significant progress has been made, lives are still being lost on the transportation system. The Figure 6.5 illustrates where lives were lost in Missouri between 2009 and 2011 and illustrates how widely dispersed the challenge is.

As shown in the figure below, the majority of fatalities on the transportation system occur while driving or riding on Missouri roadways. In 2012, 826 people lost their life as a result of a traffic crash and an additional 5,400 people were seriously injured.

Figure 6.5 - Transportation Fatalities, 2012



These fatalities are attributed to a number of factors. Missouri's Coalition for Roadway Safety has focused on these areas through an emphasis on education and enforcement. The results are impressive. As Table 6.2 illustrates, fatalities involving a variety of driver behaviors and attributes have decreased significantly since 2005.

Table 6.2 - HOW LIVES WERE LOST (2005 v. 2011)

Fatalities Involving	2005	2011	Improvement Since 2005
Aggressive Drivers	521	310	40%
Substance-Impaired Drivers	269	221	18%
Distracted Drivers	273	161	41%
Unrestrained Occupants	621	380	39%

Road Safety Improvements Have Saved Lives

MoDOT has also focused on making safety improvements to the road system itself by focusing on the components of the system that most often involve crashes and fatalities. Table 6.3 illustrates the progress made in a variety of crash types where transportation investments can reduce fatalities.

Table 6.3 - HOW LIVES WERE LOST (2005 v. 2011)

Fatalities Involving	2005	2011	Improvement Since 2005
Run-off Road Crashes	594	398	33%
Horizontal Curve Crashes	427	270	37%
Intersection Crashes	172	121	30%

The following is a discussion of the engineering strategies that have contributed to this reduction and further opportunities that exist for improvement. The success in this area is a result of MoDOT's investment in a variety of focused safety features.

Keeping Drivers on the Road

It is important to keep the driver on the road because once the vehicle leaves the roadway, obstacles like ditches, utility poles and trees greatly increase the chances of injuries to the driver and occupants. To help keep drivers on the roadway, MoDOT has implemented several roadway safety features.

Installing **guard cables** in the median of divided highways has been very effective in saving lives. In the year prior to installing guard cable on Interstates 44 and 70, 49 travelers lost their life by crossing over the median into oncoming traffic. The year after installing guard cables, the number of fatalities decreased to three. MoDOT has aggressively installed guard cables on many of the state's divided highways and today, over 800 miles of divided highways have guard cables.



Guard Cables have proven effective on divided highways

Adding shoulders with a rumble strip to a road like the one shown below can have a big impact on safety. Nearly 20,000 of Missouri's 33,700-mile road system have no shoulders. These are not typically the Interstates or more heavily traveled highways like U.S. 36, U.S. 50, U.S. 54, or U.S. 60. Instead they are often minor roads that carry low volumes, such as Routes B, E, CC, OO, etc. These roads can carry as many vehicles as a few thousand per day or as little as a few dozen, but they are used by Missourians every day to get from farm fields to home and from home to school.



Before Two-Foot Shoulder



After Two-Foot Shoulder

Data shows that adding a shoulder with a rumble strip reduces crashes by 37 percent. At \$150,000 per mile, adding shoulders to every mile of roadway may not be feasible, even over the 20-year time horizon.

Rumble strips are a grooved pattern in the pavement that alert drivers by causing the wheels to noisily and suddenly vibrate if the vehicle leaves the driving lane. Over 11,000 linear miles of rumble strips exist on Missouri's roadways today.

Guardrails can provide further travel safety for some roadways. They can keep vehicles from leaving the roadway, but can also be an obstacle to vehicles.



Rumble strips



Guardrail

Improving Curves

As shown in the table below, it was determined that 275 fatalities and 1,367 serious injuries occurred at the top 1,000 curve locations where the most crashes occurred between 2007 and 2011. A systematic approach to improving these and other roadway curves can dramatically improve safety in the future.

Table 6.4 - CURVE DATA (2007-2011)

	Top 100	Top 200	Top 500	Top 750	Top 1,000
Lives Lost	64	134	235	275	275
Serious Injuries	343	509	907	1,117	1,367
Potential Lives Saved	4	8	14	17	17
Potential Injuries Prevented	21	31	54	67	82

Straightening curves can be done in a few locations, but costs can be prohibitive, especially if the terrain is less than ideal or if homes, businesses or utilities would be impacted.

Adding shoulders and installing signs and guardrails can be a more cost-effective approach. These improvements, along with resurfacing the curve, can be made for around \$65,000 per location.



Curve with shoulders and signs

Intersection Improvements

Intersections exist where two or more conflicting traffic flows meet at a single point, and by their very nature, can be susceptible to high incident rates. Missouri has thousands of intersections, including low speed city streets with stop signs, side roads entering high-speed four-lane highways and instances where highways or streets meet with railroads or sidewalks.

The following table identifies a few of the improvements that can be made to improve safety at intersections, as well as their anticipated crash reduction rates and average costs in today's dollars.

Table 6.5 - INTERSECTION SAFETY IMPROVEMENTS

Intersection Solution	Crash Reduction	Average Cost (2013 \$)
Traffic Signals	14%	\$250,000
Roundabout	82%	\$500,000
J-Turn	63%	\$400,000
New Interchange	57%	\$10,000,000

Traffic signal installations generally reduce right angle crashes by 67 percent. Safety at these intersections relies on compliance with the signal, and when crashes occur they can be at high speeds and acute angles. The average cost of installing a signal is \$250,000.

Roundabouts essentially eliminate severe crashes because head-on and high-speed right angle collisions are virtually eradicated. Additionally, when crashes occur, they tend to be at slower speeds and safer angles. Roundabouts can be constructed for an average of \$500,000 and can reduce crashes by 82 percent.

Adding turning lanes to undivided roadway intersections is a low cost method of increasing safety. Improvements can include adding a dedicated turn lane to an existing road, which costs around \$100,000 per location, or constructing J-Turns, such as the one pictured below. J-Turns reduce severe crashes because they eliminate potential conflicts by forcing the traffic entering the main road to turn right. Once on the main road, travelers then merge and turn around through a separate median. The average cost for a J-turn is \$400,000 and crashes are reduced by 63 percent as a result of this measure.

Interchanges provide dedicated lanes for travelers to enter and exit roadways without directly crossing traffic. These improvements can reduce crashes by 57 percent, but even a simple interchange can cost \$10 million, and the cost can be substantially more depending on factors such as the size, number of lanes and traffic volume.



J-turns reduce crashes

Adding lanes to existing roads, such as improving a highway from two lanes to four lanes, or to a shared four-lane roadway, can improve safety by providing motorists with passing opportunities without having to use the lane normally reserved for oncoming traffic. Shared four-lane roadways, such as state Route 5 between Camdenton and Lebanon, have been shown to reduce severe crashes by 30 percent. Shared four-lanes cost about \$2 million per mile — about half the cost of a four-lane roadway.



Shared Four Lanes offer periodic passing lanes in both directions

Railroad crossings between roads and rail tracks occur all over the state. There are about 3,800 public road-rail crossings and over 3,000 private crossings.

MoDOT partners with railroad companies to improve safety at crossings and performs rail inspections for the safety and security of rail users, vehicle travelers and adjacent land owners and businesses. Each year Missouri receives \$6 million in federal funds and matches it with \$1 million in state funds to improve safety at railroad track crossings.

About half of the public track crossings use signs to notify the driver of the crossing. Of these 1,900 crossings, it is estimated that half of them need to be upgraded to include lights and/or gates. At \$250,000 per crossing, the total cost of these improvements statewide would be \$250 million.



Lights and gates notify drivers of oncoming trains

Most of the other public crossings already have lights and/or gates to notify drivers of oncoming trains. It is estimated that 5 percent of these 1,900 crossings need more advanced lights and gates for a total cost of \$25 million. For 1 percent of these crossings, it is

recommended that the roadway and railway be separated with a bridge, completely removing the conflict between vehicles and trains. Bridges cost approximately \$2 million to build.

The total cost of grade-separated improvements, estimated to be needed at over 1,000 public road crossings across the state, would be over \$300 million.

Accommodating Pedestrians and Bicyclists

Pedestrians and bicyclists are at a much higher risk of a serious or fatal injury than are occupants of motor vehicles when involved in an accident. To better accommodate pedestrians and bicyclists, the transportation system can be improved by adding shoulders or dedicated bike lanes to highways, adding sidewalks and improving signs, signals, and road markings. MoDOT evaluates the impact to pedestrians and bicyclists as road and bridge projects are designed. Safety improvements include installing and improving signs, signals, lighting and road markings. In some cases, separate paths such as sidewalks and bike lanes are recommended.



Sidewalks adjacent to a city street



Designated lanes accommodate bicyclists and pedestrians

Work Zone Safety

In order to build these safety improvements, people must work in construction work zones that are often adjacent to the traveling public. Staying safe in work zones is a partnership the department shares with the driving public. This partnership is growing stronger, as lives lost in work zones have seen a steady decline. Crashes and injuries have also dropped.

Several recent enhancements have played a role in this decline, including bigger signs, brighter vehicle lights, more frequent alerts to approaching motorists and increased law enforcement. But in the end, nothing can replace the act of simply paying attention.



Crashes in work zones have seen a steady decline

MoDOT is Prepared for both Planned and Unplanned Incidents

Providing a safe transportation system also includes planning for incidents, whether the events are scheduled, such as sporting events and parades, or are unplanned events, such as accidents, stalled vehicles, tornadoes and hazardous spills. Each of these incidents can result in considerable congestion, delay, secondary accidents, closed roadways and traffic detours.

To prepare for these incidents, MoDOT has collaborated with local and state law enforcement and emergency response agencies to develop an Incident Response Plan. The partnerships formed as a result of this plan allow responding agencies to work together effectively to address the incident and restore traffic to its normal operation as quickly and safely as possible.

One of MoDOT's primary responsibilities is to make sure the road network is capable of moving equipment, supplies and response personnel to an incident and providing safe evacuation routes for the general public. In addition to providing for the safe and efficient flow of traffic, MoDOT must also be prepared to provide any assistance toward stabilizing an incident and protecting life, property and the environment. MoDOT's incident response philosophy is to utilize every resource available to respond to incidents and make the transportation system safe.

MoDOT also works collaboratively with partners such as federal inspectors, the Missouri State Highway Patrol and local law enforcement to ensure that commercial motor vehicles are safe, which keeps everyone traveling on the roads safe.

Strategies to Move Forward

Achieving the **Zero Lives Lost** goal will require a tenacious safety commitment by all Missourians and travelers of our state. Over the next 20 years, continued leadership and actions from the Missouri Coalition for Roadway Safety, along with innovative safety products, vehicle technology and strategies identified in this section will make this vision a reality. We cannot lose our safety focus — our families, friends and loved ones are too important.

The following are the ways in which MoDOT and its safety coalition partners will achieve this vision:

1. **Investing in system-wide safety improvements that reduce roadway fatalities and disabling injuries.** The majority of transportation fatalities occur on roadways. Investments in median guard cables, rumble strips, roadway shoulders and improved intersections have proven to save lives. Expanding these and other types of improvements are needed to save more lives around the state.
2. **Increasing access and providing protection for bicyclists and pedestrians.** Biking and walking are popular transportation choices for many people. Unfortunately, bicyclists and pedestrians are vulnerable travelers who have a higher risk for death or serious injury when involved in a motor vehicle accident. Improved access points, dedicated lanes and traffic barriers can improve the safety for these users.
3. **Providing safer, secure links and connection points between the various types of transportation.** Transportation users must reach their destination safely, regardless of how they choose to travel. While this means our transportation system must be



Increasing safety belt usage is a key strategy moving forward

designed and operated with an eye toward preventing fatalities, it also means making sure our transit stops and park-and-ride lots are secure and free of crime. It means providing sidewalks to safely link the transportation systems and having plans in place to minimize the impact of natural or man-made disasters, should they occur.

4. **Expanding partnerships with safety advocates around the state to identify and implement safety improvements.** Transportation agencies alone cannot reach the goal of zero lives lost. A collaborative effort is needed with safety advocates around the state, including businesses, law enforcement, emergency medical services, healthcare providers and concerned citizens, to improve safety. Combining resources and developing unified goals provide the best results. Actions led by the Missouri Coalition for Roadway Safety have already saved thousands of lives, and the coalition must continue to lead Missouri's transportation safety messages while expanding its reach to include all transportation users.
5. **Increasing safety belt usage.** The single most important action Missourians can take to save lives and prevent serious injuries while traveling is to buckle their safety belts. The transportation community must support initiatives to increase safety belt usage in local communities and throughout the state.

GOAL: INVEST IN PROJECTS THAT SPUR ECONOMIC GROWTH AND CREATE JOBS

Missouri's transportation system impacts the state's economy in many ways. Missouri businesses depend on a well-connected system to get their products and services to markets within the state, across the nation and around the globe. An efficient transportation system lowers transportation costs, allowing households and businesses to invest in other parts of the economy. A strong transportation system attracts new businesses and helps existing businesses remain competitive by improving access to customers, markets and employees. Sound transportation investments can create jobs, support growth in business and increase household wealth.

Making Strong Transportation Connections

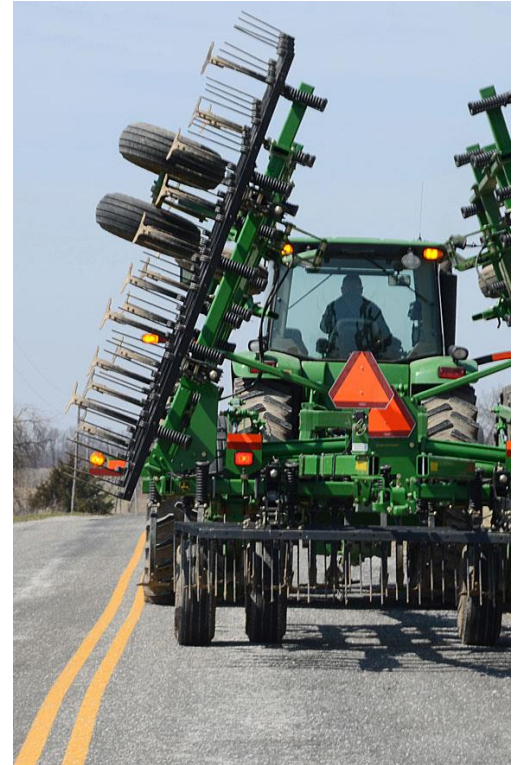
Annually, more than 800 million tons of freight originate, terminate, or pass through Missouri by rail, trucks, ports and airports. Missouri businesses depend on the transportation system to provide choices in how to get their goods to market. The system must have strong connections between the highways, local roads, railroads, air and river ports to give businesses the choices they need.

This means a system of transportation connections that allows goods to move quickly and efficiently from their origin or manufacturing sites to distribution centers and sales points. Goods cannot come into or flow out of these distribution centers without a well-connected and efficient transportation system of highways, railroads, waterports and airports.

In a state with a rich agricultural heritage and thriving agricultural industry like Missouri, which has the second largest number of farms in the country, supporting farmers' abilities to get their products to market is essential. The transportation system plays a strong supporting role to the industry in this way. Agricultural products are the state's sixth largest export, and food manufacturing is the largest manufacturing sector in Missouri. A reliable and well-connected transportation network ensures that Missouri's 100,000-plus farms can get their products to consumers, distribution centers and processing facilities quickly.

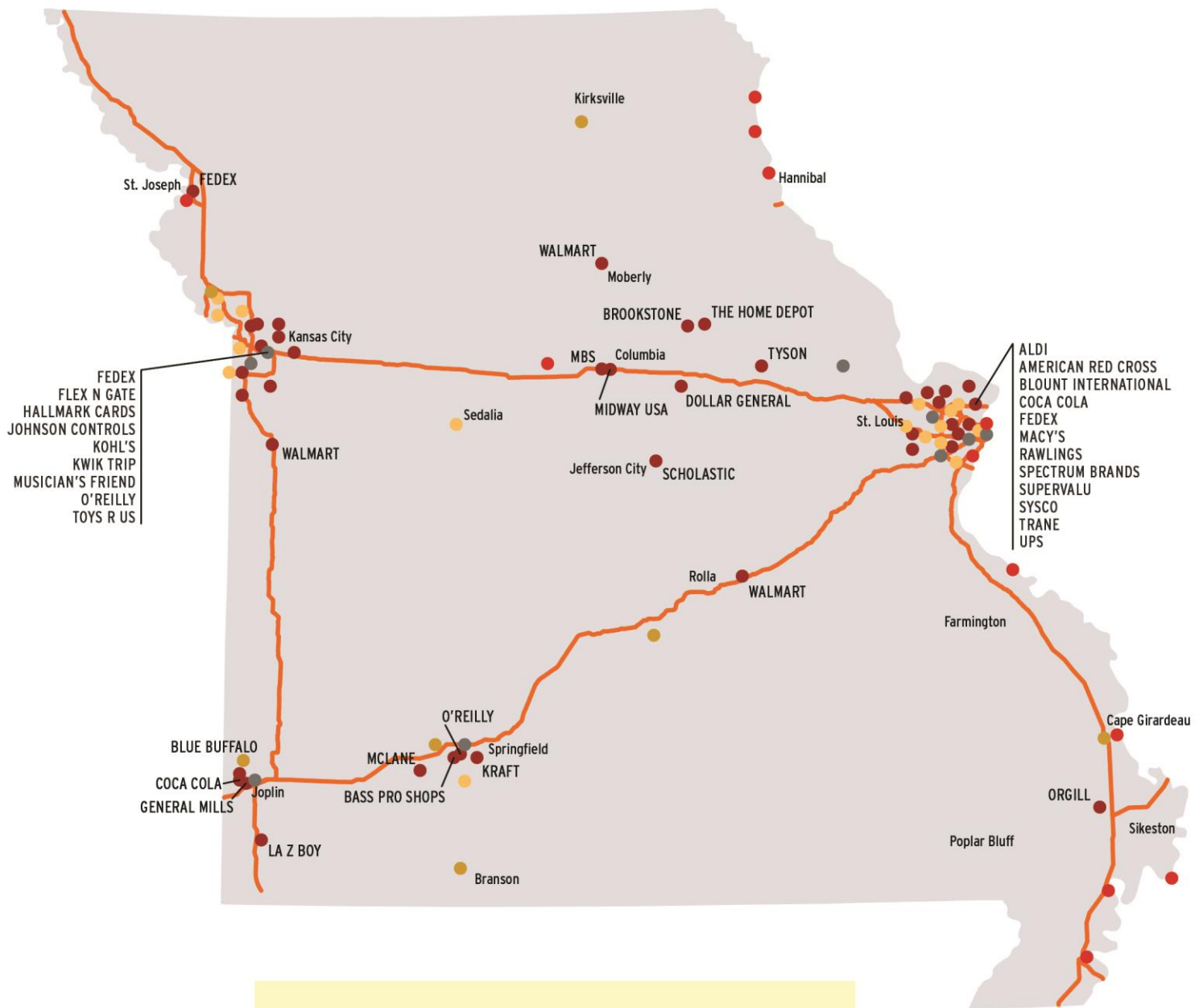
One example can be found in the soybean industry, which processes the largest agricultural crop in the state. As the seventh largest soybean producer in the nation, Missouri's soy products are distributed worldwide, and more than half of the state's harvest is exported each year. The remaining crop travels throughout Missouri to feed livestock— Missouri is one of the top three producers of cattle — and goes into a variety of soy products in the food manufacturing sector. Getting this harvest and the related products to a global market requires a reliable and well-connected transportation system of roads, rails and ports. Not surprisingly, when Pioneer Hi-Bred opened a new soybean production plant in New Madrid in 2011, they chose their location based on highway and river transport access.

Traditional agriculture may be at the core of the state's character and foundation of the state's economy, but Missouri is taking agricultural sciences into the future. The St. Louis region is home to a large number of bioscience companies that focus on advancing both livestock and crop agriculture through innovation, such as Monsanto, Bunge North America and Purina. Kansas City has staked its claim as a global leader in animal health and nutrition, with area companies accounting for 32 percent of global sales in the animal health market. The Animal Health Corridor stretches from Columbia in the east to St. Joseph and Maryville in the northwest, with Kansas City as its concentrated hub. The Kansas City metro area has the highest concentration of animal health interests in the world. Because these companies have national and global interests, fast and reliable access into and out of these areas is essential for maintaining the competitiveness of existing companies and for continuing to draw business interest to the region.



Safe and adequate roads are essential to agricultural success in Missouri

Figure 6.6 – Major Distribution Centers



MAJOR DISTRIBUTION COMPANIES

- Major Distribution Centers
- Major Airport
- Trucking Companies
- Port Authorities
- 3PL Companies

Strong links in the transportation system are also needed to connect the businesses in Missouri to customers and workers. This means a strong local road network, but alternatives such as public transit, bicycle facilities and pedestrian options need to be included. Offering these choices allows customers easy access to goods, workers vital access to jobs and improves the quality of life for Missourians.

Saving Businesses and People Time and Money

Investments in the transportation system can impact the Missouri economy in a variety of ways. The most direct benefits can be generated by transportation investments that improve travel time and reliability, saving the state's businesses and citizens time and money. When businesses can ship goods faster and more reliably, or persons can get from A to B more efficiently, the costs of transportation are lowered and business productivity is improved.

These savings occur in a number of ways. Improved transportation connections can result in fewer miles and hours traveled. If a project relieves congestion or an improvement in transit service offers another alternative, vehicles will experience fewer stop-and-go flows and idle times, resulting in increases in fuel efficiency and lower operating costs. Even improving the quality of the pavement can save wear and tear on vehicles and reduce costs to users.

When these transportation efficiencies occur, businesses spend less on transport, and as a result, have more money available for hiring and investing in technologies that make them more competitive and increase their market share. Similarly, as users save on fuel and vehicle costs, they have more money that can be spent on goods and services in the economy.

One example is the kcICON project, which relieved congestion, and as a result is saving people and businesses time and money. The project rebuilt four miles of Interstate 29/35 in Kansas City and included the new Christopher S. "Kit" Bond Bridge over the Missouri River. Traffic now flows more smoothly, and with over 100,000 vehicles per day traveling the corridor, the cumulative time and money savings to drivers are significant.

Attracting New Businesses and Supporting Existing Ones

Transportation infrastructure and performance are often essential considerations for business development professionals when looking to locate. Improved travel time, reliability of commuting time and access to transportation connections can all be important factors when selecting a location.

As a part of On the Move, MoDOT conducted a series of eight economic impact case studies. The studies looked at past investments across the state to examine how they attracted businesses and supported job growth. Table 6.6 summarizes the findings*:

Table 6.6 - ECONOMIC CASE STUDY RESULTS

Project	Year Complete	Cost (millions)	Jobs Supported Since Completion
I-70 Interchange at Little Blue Parkway in Independence	2001	\$8.6	1,182
Highway 370 in St. Louis	1996	\$172.0	8,816
James River Freeway in Springfield	1996	\$56.0	11,691
East 32nd Street in Joplin	1995	\$8.3	9,857
Riverside Road in St. Joseph	2007	\$11.2	538
The Port at New Madrid	2009	\$2.6	178
Grindstone Parkway in Columbia	2005	\$15.7	2,689
Avenue of the Saints in Bowling Green	1999	\$17.1	733

**It should be noted that these case study findings are not intended for project-to-project comparisons. Some of the projects were constructed in the mid 1990's, allowing the subsequent growth to occur over 15 years as opposed to those that are more recent. The projects also varied in size and scope, from a \$2.6 million investment to improve truck and rail access at the New Madrid Port to the construction of a brand new 12-mile \$172 million 6-lane freeway in St. Louis.*

Although the size, scope and location may have varied across the projects that were selected for study, they were similar in one important way — the resulting economic impacts of the project were significant. Each of the projects attracted businesses, supported job growth and positively impacted the community.

For example, the I-70 interchange at Little Blue Parkway, constructed in 2001, provided access to undeveloped land that attracted over 200,000 square feet of office space. Currently, this development houses the Philadelphia Insurance Company, the University of Phoenix and the Blue Ridge Bank and Trust headquarters. In addition, Centerpoint Medical Center, which is currently the city's third largest employer, built a new campus. At the time, the hospital CEO told the Kansas City Business Journal that "we're anticipating a 25 percent growth in our active medical center staff" due to the new campus.

In St. Joseph, Riverside Road (state Route AC) was extended two miles from Picket Road south to U.S. Highway 169 in 2007. The extension allowed the community to open Eastowne Business Park, which is now home to Boehringer Ingelheim Vetmedica Inc., the city's fifth largest employer. Regarding the project, R. Patt Lilly, President and CEO of St. Joseph Metro Chamber and Economic Development Council said, "The Riverside Road Route AC extension was a key component in St Joseph's ability to develop a 350-acre agricultural tract into a state-of-the-art business park."

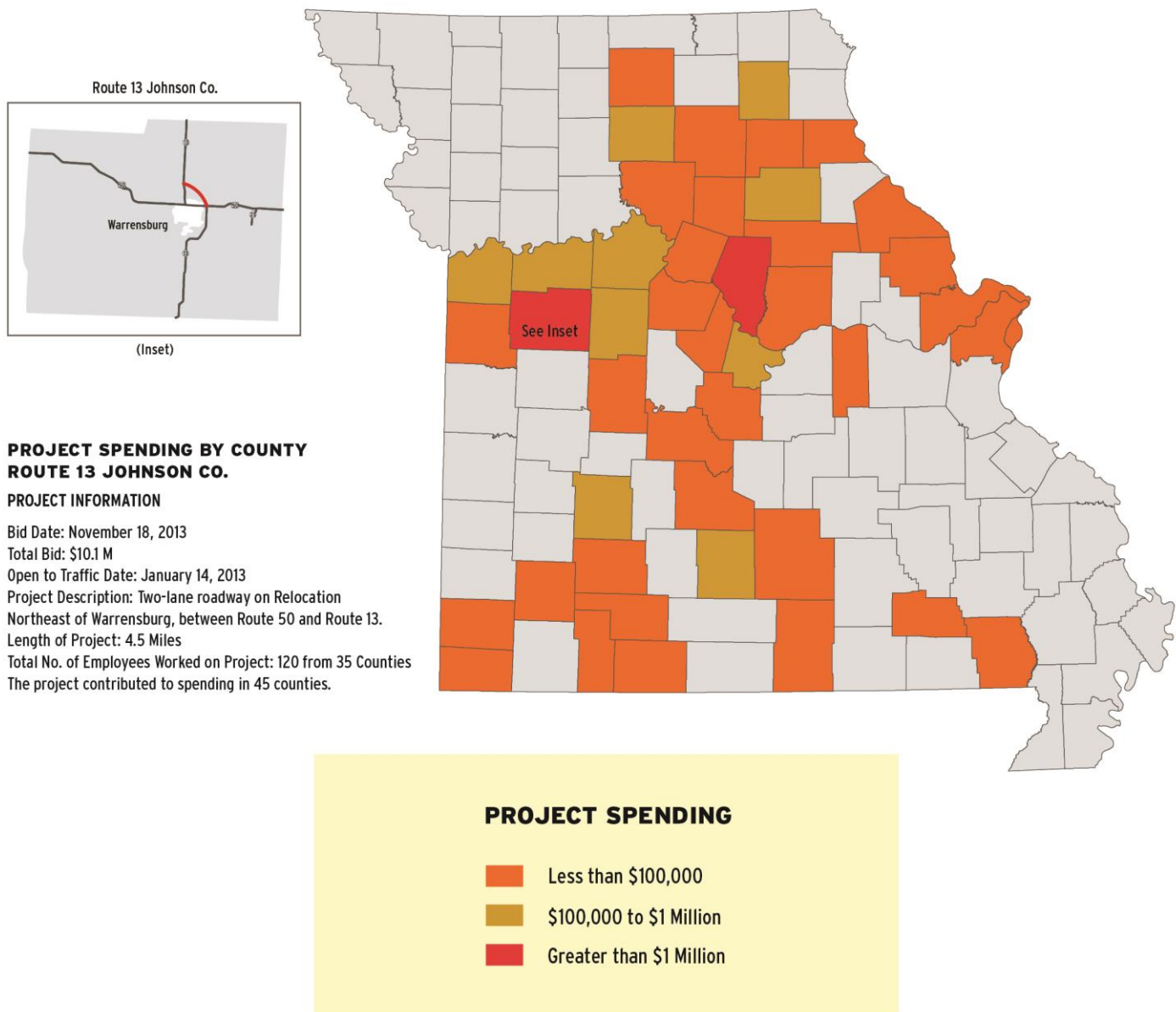
Transportation improvements not only can attract new business, they can also be leverage to support the growth of existing businesses. Some recent examples in Missouri include:

- The I-270 and Dorsett interchange improvements for expansion of the Edward Jones headquarters in Maryland Heights. MoDOT contributed \$10 million to the \$32.8 million dollar cost. At the end of 2011, 588 of the anticipated 1,000 new jobs had been created.
- The Poplar Bluff Regional Medical Center improvements provide another access point into the city of Poplar Bluff and create new places for business development. MoDOT contributed \$4.6 million to the \$13.4 million project which included improvements to Route 67, Business Route 67 and Oak Grove Interchange. The project is anticipated to create 125 new jobs by 2018 and 250 new jobs by 2023.
- The I-35 and Route 69 interchange improvements in Clay County were built to support the Ford Motor Company assembly plant expansion located along Route 69 in the Village of Claycomo. Ford's investment of \$1.1 billion includes 1,600 new jobs at the plant. MoDOT's share of the \$35.6 million included \$13.2 million.

The Impact of Construction

The construction of transportation projects also creates jobs and positively impacts the state and local economy for the short term. Jobs generated by construction include not only those of the workers on the job site, but also those of the companies that supply the equipment and materials needed for the construction. These impacts are often widely dispersed, and projects in one part of the state can support jobs in all corners of Missouri. Figure 6.7 illustrates where project spending occurred during the construction of Route 13 in Johnson County in 2011. This \$10 million project hired employees in 35 counties and the project spending impacted 45 counties.

Figure 6.7 - Project Spending for Rte. 13



Source: Associated General Contractors of Missouri

The Impacts Multiply

The economic impacts resulting from transportation investments flow through the economy and multiply. As businesses save money and hire more workers, those workers spend their wages in other sectors of the economy. This can be seen in the analysis performed by the Missouri Department of Economic Development. That analysis showed that every dollar invested in MoDOT's construction program generates about \$4 in new economic activity.

This 4 to 1 ratio represents an average for the entire MoDOT construction program. For those projects that are targeted specifically at supporting the economy and growing jobs, the multiplier can be even higher. MoDOT develops partnerships with local communities and businesses through its Cost Share Program. One of the project selection criteria of the program is economic development, and projects that can be demonstrated to create jobs are eligible for up to 100 percent funding (as opposed to the typical 50 percent). This tremendously successful program has grown from an annual amount of \$15 million in 1998 to

\$45 million today and has leveraged more than \$1.1 billion of private and local government funding since its inception.

Strategies to Move Forward

Missourians expect to get to their destinations on time and without travel delay regardless of how they choose to travel. Businesses need access to employees and customers to buy their products and deliver their services. Companies need reliable and convenient transportation options to ensure just-in-time delivery needs are met, whether they are to a grocery store across town or to a processing plant overseas. The following strategies will help to achieve this vision of supporting and creating jobs in Missouri:

1. **Increasing partnerships with local communities, businesses, transportation service providers and other sectors to specifically identify what transportation projects can better support local economies.** Transportation agencies and stakeholders must better understand what local communities and businesses need from the transportation system. Working collaboratively with local governments, chambers of commerce and business owners will help identify the improvements needed for local economies to thrive and create jobs.
2. **Expanding MoDOT's cost share opportunities to include all transportation modes.** MoDOT's cost share program stretches transportation funding by pooling money with local governments and private entities to deliver state highway and bridge improvements. Expanding the program to include non-highway transportation improvements could better meet the diverse needs of our transportation system.
3. **Identifying the statewide freight network to serve the needs of Missouri businesses.** Identifying the highway network most used or preferred by freight haulers will provide more cost effective choices that can translate into cheaper prices of goods for Missourians. Recognizing these routes will be beneficial in the overall needs identification and project prioritization process. In addition, it will be useful in the project development process as truck-friendly features and design elements of proposed projects are selected to complement freight needs.
4. **Developing intermodal connectors that better link the state's rivers, rails, roads and runways.** Missouri's central location and rivers, along with its existing airports, railroads and highway infrastructure make it an attractive home for many successful businesses. However, these businesses could become stronger competitors and the state could attract additional business by strategically connecting these assets and providing for more timely and cost-effective delivery of products while lowering the cost of goods for Missourians.
5. **Providing reliable and accessible transportation options to get people to work and customers to businesses.** Missouri businesses need access to employees and customers. Demographic trends are changing and the over 65 age group is growing faster than any other demographic. The younger generation will make up the primary driving population by 2030, and their travel preferences may differ from previous generations. The transportation system must adapt to these changes so businesses can still remain competitive.

GOAL: GIVE MISSOURIANS BETTER TRANSPORTATION CHOICES

Whether it's deciding on the type of toothpaste to buy or where to eat dinner, Missourians want choices, and in today's fast paced world of mobile phones and information on demand, people expect to be able to choose what they want, when they want. A theme heard during the On the Move engagement is that transportation services are viewed in this same light — Missourians are indeed on the move, and they want more options for how they travel.

Most Missourians still choose to drive their personal vehicle for the majority of their travels — so it's important to maintain and provide good mobility for the network of highways, bridges, county roads and city streets. Good mobility is important to all areas of the state. The roadway network must continue to be improved and expanded in an effort to minimize time wasted in traffic, improve the ease of travel and remain reliable for travelers.

Despite most citizens' preference for the personal vehicle, some changes are underway. The baby boomer population is aging and they will need mobility options as driving becomes more challenging. Young adults are driving less than previous generations and they rely on technology to substitute for travel when possible. Driving is more expensive than ever as gas prices have increased dramatically in recent years. These trends, coupled with an uncertainty about how future innovations might change the way we travel, necessitate the need for a transportation system that provides flexible options.

Missouri has opportunities to improve in this area. Throughout On the Move, Missourians expressed a desire for increased scheduled services, improved speeds and more reliable on-time arrivals for bus and rail options. In some instances, options such as transit, passenger rail and bicycle/pedestrian facilities are either inadequate or non-existent. What follows is a discussion of the ways in which travel options can be improved in Missouri.



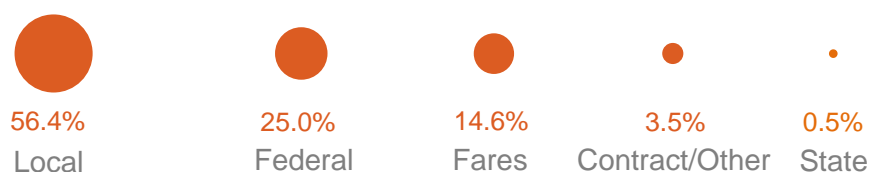
Missourians want more public transit options

Additional Urban and Rural Transit Options Are Needed

A significant opportunity to expand travel options exists for rural and urban transit. These services provide many Missourians with their only means of mobility. In addition, the state's growing elderly population is expected to rely on transit to get to shopping centers and healthcare services. Public transit also provides an important link in the economy of Missouri by ensuring workers can get to and from their jobs and so that businesses have access to the workforce.

In Missouri, minimal state funding has been provided for public transit. As shown in Figure 6.8, less than 1 percent of public transit funding comes from the state. In Missouri, local governments provide the majority of transit funding because the bulk of transportation revenues are constitutionally earmarked for roads and bridges. Funding for transit has traditionally come from the state's general revenue fund where it must compete with a multitude of other needs.

Figure 6.8 - Missouri Transit Funding Sources



State funding for transit is much higher in many of Missouri's neighboring states. As shown in Table 6.7, the state funding per capita for transit is \$0.50, which ranks 39th in the nation, and is the second lowest among Missouri's surrounding states.

Table 6.7 - STATE TRANSIT FUNDING COMPARISON

State	State Funding per Capita	National Ranking
Illinois	\$102.80	6th
Tennessee	\$6.93	22nd
Iowa	\$4.16	26th
Kansas	\$2.09	28th
Nebraska	\$1.57	29th
Oklahoma	\$1.52	30th
Arkansas	\$1.11	34th
Missouri	\$0.50	39th
Kentucky	\$0.34	42nd

Source: AASHTO's Survey of State Funding for Public Transportation, Final Report 2013, FY11 data

For urban transit areas, expanding travel options could mean adding routes or increasing the frequency of existing bus services, investing in light rail options such as MetroLink in St. Louis, providing bus rapid transit like the MAX in Kansas City, or constructing the recently approved Kansas City Streetcar that will serve a two-mile segment of the downtown area.

Each of these options requires an upfront investment to purchase the equipment and vehicles, and an ongoing operating cost to fund fuel, vehicle maintenance and drivers. The cost of these systems varies greatly, but on average, upfront costs for bus rapid transit are \$35 million per route plus annual operating costs, while light rail costs are \$60-90 million per mile plus annual operating costs. The Kansas City streetcar system will cost about \$100 million plus about \$3 million annually for operating costs.



MetroLink in St. Louis is an example of light rail service

Rural transit services are needed to offer better access to employment, schools, shopping and medical services. On average, rural Missouri counties provide fixed route service just two days per week with some counties offering it as infrequently as one day a month. On-demand services, where people arrange transport in advance, are also used. Improving these options often requires a capital investment (such as purchasing vans or buses) but in rural areas the greater challenge often lies in meeting the ongoing operating needs, such as the costs of fuel, vehicle maintenance and drivers' wages each year.



OATS is the leading provider of public transit in rural Missouri

Passenger Rail Service is Increasing in Popularity

Increased interest in passenger rail service has been noticed across the nation recently, and feedback obtained from On the Move was no different. Passenger rail was discussed consistently and frequently as an opportunity for improvement. Much like the nation as a whole, Missourians are looking to expand and improve upon passenger rail networks and services.

In Missouri, rail service is currently provided twice each day from St. Louis to Kansas City, with stops in Kirkwood, Washington, Hermann, Jefferson City, Sedalia, Warrensburg, Lee's Summit and Independence.

The primary state role in providing passenger rail service comes in the form of \$8-\$9 million annually in operating assistance for the twice-daily round trips for the Amtrak route between St. Louis and Kansas City. Much like other transit programs, these funds have been allocated from the state general revenue fund and are susceptible to annual legislative budgetary pressures. Throughout *On the Move*, it was stressed that maintaining this level of state support and exploring options for its expansion are important.



Passenger Rail has gained in popularity

In addition to the annual funding, MoDOT is part of an effort to improve a multi-state corridor. The project will leverage \$20 million in private investment along with \$49 million of federal funds to add capacity to the passenger rail line along the portion of the corridor covered by the Missouri River Runner route from Kansas City to St. Louis. The project will be completed by 2016 and includes several track improvements to provide good on-time performance and efficiently move freight. Also included are eight new state-of-the-art bi-level rail cars that will improve the ride and increase capacity.

These improvements demonstrate what can be accomplished on the existing state-sponsored route, but Missourians have also asked for additional improvements. In the recently published Missouri State Rail Plan, an additional \$1.4 billion in needs were identified for the existing corridors, including additional service frequency, improved speeds and passenger amenities such as Wi-Fi. In addition, expanding passenger rail service to new corridors is also frequently identified as a need. The State Rail Plan identifies several potential new corridors, each of which is estimated to cost over \$1 billion, including:

- Quincy-Hannibal-St. Louis
- Kansas City-St. Joseph-Omaha
- St. Louis-Springfield
- Springfield-Kansas City

An additional benefit of making track improvements to accommodate the speed and reliability for passenger rail is that these improvements provide the same benefits to moving freight on the rail system.

Bicycle and Pedestrian Facilities are Important

Bicycle and pedestrian facilities play an important role in transportation, especially for those who do not drive. They also make important connections to the other components of the

transportation system. Many of these facilities are typically found on the local transportation system and are often thought of as the responsibility of local governments, but these facilities exist all over the state. MoDOT has modified the project development process to consider bicyclist and pedestrian needs and facilities early in the project development state. Continued improvement in this area will ensure that these needs — such as considering bicyclists when designing and maintaining shoulders on state highways, considering pedestrian accommodations when building or improving a bridge or adding bicycle lanes on a state highway — are incorporated whenever feasible.

Aviation Options Keep Missouri Connected

The state's nine commercial service airports allow residents and businesses to connect to the national and international airspace system. The state supports commercial service airports in their efforts to bring expanded air service to Missouri (new carriers, new routes, etc.), which provide more flight options and lower costs for travelers. The 35 business-capable airports, which include the nine commercial service airports, support local and regional economies by providing efficient travel that can accommodate large corporate jets. The remaining 90 public use airports are classified as general aviation facilities and typically accommodate activities such as emergency service, charter or critical passenger service, cargo operations, flight training and personal flying. The state provides funding support to all public airports in the state for pavement maintenance, safety improvements, runway extensions and taxiway construction.

Strategies to Move Forward

Missourians want options when deciding how to travel. They don't want to have to drive a car for every trip they take — they want to bike and walk to work, take a bus to a doctor's appointment or go shopping, and have the option to take a train across the country or an airplane around the world. The following strategies will help to meet the goal of providing Missourians better transportation choices:

1. **Increasing regional involvement to include all transportation stakeholders when identifying and prioritizing projects.** For nearly a decade, Missouri's planning framework for transportation decision making has been successful at bringing together transportation planning partners, stakeholders and interested citizens to determine each region's highest priority highway and bridge needs. It is time to build upon this success and expand the process to include a wider range of modal partners and to consider and prioritize needs across all transportation modes, which will make the best use of our available funding and provide for a well-integrated and better-connected transportation system.
2. **Securing reliable funding that is flexible and can be used to address each region's transportation priorities.** The majority of MoDOT-administered transportation funding is limited, by law, to use on road and bridge improvements. Going forward, flexible funding that can be used across all modes of transportation is needed to deliver the highest priority transportation needs determined by each region.
3. **Evaluating the impact to all transportation modes during the development of an improvement.** As transportation solutions are evaluated and developed, impacts to other modes must be considered to take advantage of opportunities that may exist.
4. **Connecting travel options — passenger rail to bus stops to sidewalks to airports.** Travelers desire a transportation system that is seamlessly connected. MoDOT and its transportation partners need to identify where gaps exist and develop solutions to improve the system for travelers.
5. **Expanding and improving transit, air, passenger rail, bicycle and pedestrian options throughout the state.** Many Missourians expect more non-highway travel options. The majority of current transportation funding is legally restricted to use on highways and bridges and barely covers the cost of maintaining that system. Additional transportation funding that could be used on any mode of transportation

must be made available to expand the frequency and service area for non-highway transportation services.

6. **Providing accessibility to all users of the transportation system.** Missouri's transportation system must provide all users access to opportunities — including employment, recreational activities, medical services, etc. Features such as navigable sidewalk grades, safe curb cuts and ramps and wheelchair friendly buses help ensure the system better meets the needs of all users. Transportation projects and services must be developed to better accommodate the varying abilities of all Missourians.

DELIVERING TRANSPORTATION SOLUTIONS

Achieving all of the strategies in this plan is a long-term objective — it will happen incrementally over time. This section outlines the business practices and approaches that MoDOT will use to achieve Missouri's vision.

The priorities Missourians have outlined for the future of transportation requires MoDOT to take a hard look at business practices. It will take a focused effort to make progress, but there are the following key components in delivering transportation solutions:

- Incorporate the latest technologies, innovations, cost control, competition, accountability and other methods to deliver a good transportation system.
- Identify new and enhance existing relationships with ALL transportation stakeholders (roads, bridges, transit, rail, waterways, aviation, freight, pedestrian and bicycle) to ensure the optimal transportation solution is discussed and prioritized both regionally and statewide.
- Enhance customer engagement efforts to have a continuous, real-time understanding of Missourian's needs, views and priorities for their transportation system.
- Minimize impacts to travelers when maintaining/improving the system, such as shifting work to times when there are fewer vehicles on the roads (night work, off season for tourists, etc.).
- Protect the existing environment — limit environmental and social impacts related to transportation improvements.

MoDOT has a responsibility to get the best value for each tax dollar invested in Missouri's transportation system, and the department uses a mix of innovations and processes to stretch existing funds as far as possible. Missouri's transportation needs continue to expand, making it even more necessary to find innovations and efficiencies to manage costs. This will allow MoDOT to complete more transportation improvements with the funding available. These approaches are discussed in this section.

Practical Approaches

MoDOT consciously began changing its workplace philosophy in 2005. First, *Practical Design* was introduced to help a project achieve its purpose and need so that funds are saved instead of being wasted on overdesigned items. These savings allowed more of the transportation system to be improved as projects that may have remained unfunded could now be budgeted. With practical design, there is no corner-cutting, safety is never compromised and collaboration is required for all solutions.

Practical Design has now evolved into a more "practical" approach in other areas of MoDOT. The approach has been expanded to routine maintenance activities, such as snow removal, roadway signs, pavement improvements and mowing. These activities have been evaluated

and revised to stretch the funds available, ultimately achieving a higher level of customer satisfaction. In addition, the procurement and inventory procedures have been revised to maximize the use of available funds and move towards just-in-time delivery of materials and supplies. A continued effort to apply a practical approach to transportation practices will be needed in the future.

Flexibility

Alternate bidding allows contractors to choose which equivalent material will be bid on a project. Traditionally, MoDOT had specified either asphalt pavement or concrete pavement on construction projects. By allowing bidders to determine which pavement type they could deliver for the best price and still meet the performance requirements, a 25 percent increase in bidders and a cost savings of between nine and 10 percent was realized. This ultimately allows more projects to be completed.

This concept has been expanded to bridge components where the design allows the bidders to choose to provide concrete or steel beams. Also, highway drainage pipes can be selected as either concrete, steel or plastic. The key is the contractor and industry suppliers decide what allows them to provide the most competitive bid and the customers benefit through the lowest cost at good value.

MoDOT continues to make improvements in how projects are engineered and designed by changing from *construction specifications* that prescribed methods and materials to construction specifications that focus on results and define performance (rather than specify the procedure a contractor must follow or the materials they must use in delivering a transportation improvement). MoDOT specifies how the improvement must perform. This performance-based specification system allows contractors flexibility while producing quality transportation improvements at a cost savings to the taxpayers.

Innovations

Joint *research* between MoDOT and Missouri universities has reduced the cost of transportation improvements. For example, recent research allowed the adjustment of bridge design components to be more reflective of Missouri geology and saved, on the average, \$45,000 per bridge foundation design. Missouri replaces 100 to 200 bridges each year. This type of innovation allows more transportation improvements to be completed with the funds that are available.

MoDOT uses innovative approaches during the design and construction of projects. For example:

- MoDOT uses *design-build* project delivery for some transportation projects in which a private contractor team under the direction of MoDOT both designs and constructs a transportation project, allowing for faster project completion and contractor cost-saving innovations throughout the project.
- *Value Engineering*, which strives to find additional “right” solutions for projects, is used during the design and construction phases of projects. This involves identification of alternative design solutions that meet the function of the project at a reduced cost and encouraging contractors to propose alternatives to accomplish the project in a more efficient manner than the original design plans. From 2008 - 2012, it is estimated that taxpayers saved over \$300 million using value engineering approaches.
- *Alternate technical concepts* allow potential bidders to request the pre-approval of a design or revised specification prior to submitting a bid. This allows a bidder to submit a bid with the confidence that their concept will be allowed, reducing risk to the bidder and increasing value to MoDOT and its customers.
- *Add alternates* is a concept that is helping Missouri stretch its dollars further. When MoDOT experiences a very positive bidding market, contractors routinely bid below the budget amount. This is a great result, but it takes time to prepare new projects

made possible from the savings. To aid this, some projects include additional scope on which contractors submit bids. This allows as much scope as possible be awarded based upon the project budget available and ultimately allows more transportation improvements to be completed in a shorter time frame.

- *Job Order Contracting* has been used by MoDOT since 2010. It allows MoDOT to award fixed price construction contracts with indefinite delivery time and quantity on preventive maintenance-type projects. The contractor submits bid prices for specific categories of items with adjustment factors for profit and overhead. Job Order Contracts are awarded based on the lowest responsive bidder.

Increasing Competition

MoDOT structures road and bridge contracts and schedules to increase competition among bidders and completes a detailed analysis of each bid to determine if the price is reasonable. If the bid is not reasonable, changes may be made and the project will be rebid.

Industry Collaboration

MoDOT continually involves and solicits input from the construction industry including contractors, subcontractors, material suppliers and industry associations to help improve Missouri's transportation system. MoDOT, contractors and suppliers meet regularly to discuss business practices, evaluate existing and new specifications and even construction challenges experienced on individual projects. This open and honest discussion and working relationships translates into better transportation solutions at a lower price to the customers. If uncertainty exists within a project's bid documents or contract administration practices, or if other unknowns are present, these uncertainties often translate into bid risk and higher bids.

Environmental Responsibility

Transportation has an impact on the environment. From the consideration of transportation needs through the maintenance and operation of the existing system and services, MoDOT strives to limit that impact and be a good steward of the environment. The department strives not just to meet the requirements of environmental laws, but to do the right thing by keeping the environment clean and minimizing impacts to our precious resources.

MoDOT has taken action to link environmental and transportation planning. The department partners with a variety of state and federal environmental resource agencies including the Missouri Department of Natural Resources, Missouri Department of Conservation, Missouri State Historic Preservation Office, Missouri State Emergency Management Agency, Natural Resources Conservation Service, U.S. Fish and Wildlife Service, U.S. Environmental Protection Agency and U.S. Army Corps of Engineers, to maintain an inventory of environmental and historic resources in the state. This partnership helps transportation decision makers avoid or minimize impacts to resources early in project planning. Further, MoDOT meets biannually and as needed with these agencies to seek their input on transportation needs as they are being evaluated and scoped and to partner in the environmental studies and permitting for planned projects.

MoDOT also uses environmentally friendly construction methods to deliver projects. From using recycled materials to testing smog-eating pavement in high-traffic areas, we work to limit the impact of our transportation system on natural resources. Similarly, we take action to reduce our carbon footprint by implementing changes that increase the miles-per-gallon rating of our fleet and to reduce energy usage at our facilities.

Moving forward, the department will continue to research and implement new techniques, products and technologies that will help us get even better at keeping our environment clean. We will build upon and strengthen our partnerships with natural resource agencies so we can make even better transportation decisions that limit the impact to our environment. Further, we are committed to expanding the use of recycled materials in our construction projects and providing more non-motorized travel options. Finally, we will seek out bold new strategies to reduce our energy consumption and carbon footprint.

City and County System

Many of the strategies employed by MoDOT are now being used by cities and counties in delivering transportation solutions, thereby stretching more of Missouri's transportation funds. MoDOT also is partnering with cities and counties to deliver better transportation improvements. For example, MoDOT coordinates with local governments to include adjacent work in the plans of state construction projects, resulting in better projects, taxpayer savings and more efficient construction.

Performance Management

MoDOT has achieved significant improvements in its key products and services by implementing a performance management approach throughout the organization. A profound culture change has occurred as a result of including performance management as part of the department's data-driven and results-focused approach. The culture change is reflected in how MoDOT communicates internally and externally about its performance.

Tracker, a quarterly publication of departmental performance measures, is a primary indicator of MoDOT's progress. The public document is prominently displayed on the department's website but is also extensively used internally to ensure accountability. Tracker spells out the department's mission, values and priorities and is built on seven tangible results that Missourians expect. More than 50 performance measures directly linked to tangible results are tracked to gauge performance in such areas as traffic flow, pavement and bridge conditions, safety, roadway visibility, customer service and response, innovations, project delivery, environmental impact, access to modal choices, wise use of funding and economic development.

Each division and district also has its own Tracker with metrics specifically related to its functional area. These metrics, in turn, affect the results and measurements in the department Tracker. The work-level Trackers have played an important role in the culture change that has accepted the performance management model at all levels including individual performance.

In recent years, MoDOT has seen progress from its performance management approach:

- **Safety:** Number of fatalities dropped 34 percent from 1,257 in 2005 to 826 in 2012. Rate of annual fatalities dropped from 1.83 to 1.20 for that same time period.
- **Pavement:** Percent of major highways in good condition increased 42 percent from 47 percent in 2004 to 89 percent in 2012.
- **Bridges:** Percent of bridges on major highways in good condition increased 11 percent from 74 percent in 2001 to 85 percent in 2011.
- **Customer Satisfaction:** Percent of overall customer satisfaction increased 18 percent from 67 percent in 2005 to 85 percent in 2012.

Organizational change elicits many responses — skepticism, rebellion, predictions of failure — in addition to the perceived impact on employees. In the eight years since MoDOT began its performance management journey, the doubters have become believers. At all levels, performance management is no longer considered extra work, but the way of doing business. Performance management ties together programs and projects across the agency and has created momentum for producing results better, faster and cheaper.

MoDOT's performance management journey has also put it in a unique position to help lead national efforts to establish a set of metrics for all state DOTs. The federal surface transportation act passed by Congress in 2012 established seven areas of performance. Over the next two years, Moving Ahead for Progress in the 21st Century, or MAP-21, will establish performance expectations for state DOT's in the areas of safety, infrastructure condition, system reliability, congestion reduction, environmental sustainability, freight movement, economic vitality and reduced project delivery delays. Since MoDOT already has metrics in place for several of the focus areas, it has taken a leadership position in working with the

Federal Highway Administration, as well as in mentoring other DOTs as they develop performance management systems.

Partnerships

MoDOT partners with local agencies, private industry and other entities to pool efforts and funding. These partnerships provide the resources to build projects that previously may have seemed unlikely. For example, improving Routes 36 and 67 to four lanes, and extending Page Avenue in St. Louis were achieved by pooling funds with partners. These partnerships result in accelerated projects, meaning the benefits are delivered to the public sooner. Accelerating projects can also help avoid additional costs due to inflation.

Planning Framework

The challenge facing the future of transportation is daunting. One thing is not new — a gap exists between transportation needs and transportation funding, and the impact of that gap on the safety of citizens is priority number one. Moving forward is more challenging since transportation funding is supported by a waning revenue stream and increased costs. The challenge is increased because of the diverse viewpoints regarding which improvements should be the highest priority.

A key to moving Missouri forward will be using its nationally recognized transportation planning framework process. The foundation of this process continues to evolve, but is built on public input, relationships, communication, inclusiveness and transparency. This process, in which the public and local officials work side-by-side with MoDOT to determine the highest transportation priorities for their region and the state as a whole, delivers the best results for Missourians. Planning Framework provides flexibility for each region to use both objective and subjective information to best determine which transportation needs receive funding for their area. Additional information regarding Planning Framework can be found in Appendix J.

It's time for Planning Framework to take another step forward by expanding to a more fully inclusive transportation process. Each region needs to bring all transportation stakeholders to the table, regardless of funding levels, to fully discuss and prioritize all transportation needs for the region. We heard loud and clear from Missourians during the On the Move engagement effort: transportation is more than just roads and bridges — all transportation options are important to Missourians.

MOVING FORWARD

Meeting the transportation needs of Missourians requires plans and solutions that are flexible enough to evolve as changes occur over time. MoDOT recognizes that yesterday's solutions won't necessarily be adequate to solve tomorrow's problems. A key to managing future unknowns is to strengthen relationships with transportation stakeholders.

This long range plan provides Missouri's transportation vision for the next 20 years and offers a direction for moving forward based on what we know today. Missourians' expectations of the transportation system have been shaped into four goals that will help guide future decision making. These are not just goals for MoDOT — they are for all stakeholders in Missouri because achieving these goals will require improvements to components of the transportation system that are not owned by MoDOT. As a result, partnerships with local governments, mode operators and the private sector will be essential to success.

As we progress towards our long-term plan, we will improve Missouri's transportation system of today — and ultimately move toward the transportation system Missourians envision for our state.

STRATEGIES

The following strategies were identified in earlier sections of this report, but are presented here for easy reference.

Take Care of the Transportation System and Services We Enjoy Today

1. **Establishing condition and service goals for all components of Missouri's transportation system** — including roads, bridges, airports, ports, transit, rail, sidewalks and trails. This includes identifying the current condition and level of service for each mode of Missouri's transportation system and determining the condition and level of service Missourians expect. MoDOT's performance measurement system, "Tracker," currently measures some of these areas, but would need to be expanded to include all modes of transportation.
2. **Securing dependable and flexible funding to support the current system and services for all modes of transportation.** Roads and bridges are primarily funded with dedicated federal and state fuel taxes, which have not kept up with the cost of inflation and are projected to decline in future years. The majority of funding for non-highway transportation modes does not have a dedicated source of yearly funding that make long-term improvements possible.
3. **Continuing to explore technology and developing business practices that result in lower costs to stretch funding for more improvements.** MoDOT and transportation providers must be bold, while practical, in their approach to trying innovative solutions to deliver more transportation improvements with funding available. This includes embracing new approaches from contractors and other transportation partners.

Keep All Travelers Safe, No Matter the Mode of Transportation

1. **Investing in systemwide safety improvements that reduce roadway fatalities and disabling injuries.** The majority of transportation fatalities occur on roadways. Investments in median guard cables, rumble strips, roadway shoulders and improved intersections have proven to save lives. Expanding these and other types of improvements is needed to save more lives around the state.
2. **Increasing access and providing protection for bicyclists and pedestrians.** Biking and walking are popular transportation choices for many people. Unfortunately, bicyclists and pedestrians are vulnerable travelers who have a higher risk for death or serious injury when involved in a motor vehicle accident. Improved access points, dedicated lanes and traffic barriers can improve the safety for these users.
3. **Providing safer, secure links and connection points between the various types of transportation.** Transportation users must reach their destination safely, regardless of how they choose to travel. While this means our transportation system must be designed and operated with an eye toward preventing fatalities, it also means making sure our transit stops and park-and-ride lots are secure and free of crime. It means providing sidewalks to safely link the transportation systems and it means having plans in place to minimize the impact of natural or man-made disasters, should they occur.
4. **Expanding partnerships with safety advocates around the state to identify and implement safety improvements.** Transportation agencies alone cannot reach the goal of zero lives lost. A collaborative effort is needed with safety advocates around the state, including businesses, law enforcement, emergency medical services, healthcare providers and concerned citizens to improve safety. Combining resources and developing unified goals provide the best results. Actions led by the Missouri Coalition for Roadway Safety have already saved thousands of lives, and the coalition must continue to lead Missouri's transportation safety messages while expanding its reach to include all transportation users.
5. **Increasing safety belt usage.** The single most important action Missourians can take to save lives and prevent serious injuries while traveling is to buckle their safety belts. The transportation community must support initiatives to increase safety belt usage in local communities and throughout the state.

Invest in Projects that Spur Economic Growth and Create Jobs

1. **Increasing partnerships with local communities, businesses, transportation service providers and other sectors to specifically identify what transportation projects can better support local economies.** Transportation agencies and stakeholders must better understand what local communities and businesses need from the transportation system. Working collaboratively with local governments, chambers of commerce and business owners will help identify the improvements needed for local economies to thrive and create jobs.
2. **Expanding MoDOT's cost share opportunities to include all transportation modes.** MoDOT's cost share program stretches transportation funding by pooling money with local governments and private entities to deliver state highway and bridge improvements. Expanding the program to include non-highway transportation improvements could better meet the diverse needs of our transportation system.
3. **Identifying the statewide freight network to serve the needs of Missouri businesses.** Identifying the highway network most used or preferred by freight haulers will provide more cost effective choices that can translate into cheaper prices of goods for Missourians. Recognizing these routes will be beneficial in the overall needs identification and project prioritization process. In addition, it will be useful in the project development

process as truck-friendly features and design elements of proposed projects are selected to complement freight needs.

4. **Developing intermodal connectors that better link the state's rivers, rails, roads and runways.** Missouri's central location and rivers, along with its existing airports, railroads and highway infrastructure make it an attractive home for many successful businesses. However, these businesses could become stronger competitors and the state could attract additional business by strategically connecting these assets and providing for more timely and cost-effective delivery of products while lowering the cost of goods for Missourians.
5. **Providing reliable and accessible transportation options to get people to work and customers to businesses.** Missouri businesses need access to employees and customers. Demographic trends are changing — the over- 65 age group is growing faster than any other demographic. The younger generation will make up the primary driving population by 2030, and their travel preferences may differ from previous generations. The transportation system must adapt to these changes so businesses can still remain competitive.

Give Missourians Better Transportation Choices

1. **Increasing regional involvement to include all transportation stakeholders when identifying and prioritizing projects.** For nearly a decade, Missouri's planning framework for transportation decision making has been successful at bringing together transportation planning partners, stakeholders and interested citizens to determine each region's highest priority highway and bridge needs. It is time to build upon this success and expand the process to include a wider range of modal partners and to consider and prioritize needs across all transportation modes, which will make the best use of our available funding and provide for a well-integrated and better-connected transportation system.
2. **Securing reliable funding that is flexible and can be used to address each region's transportation priorities.** The majority of MoDOT — administered transportation funding is limited, by law, to use on road and bridge improvements. Going forward, flexible funding that can be used across all modes of transportation is needed to deliver the highest priority transportation needs determined by each region.
3. **Evaluating the impact to all transportation modes during the development of an improvement.** As transportation solutions are evaluated and developed, impacts to other modes must be considered to take advantage of opportunities that may exist.
4. **Connecting travel options — passenger rail to bus stops to sidewalks to airports.** Travelers desire a transportation system that is seamlessly connected. MoDOT and its transportation partners need to identify where gaps exist and develop solutions to improve the system for travelers.
5. **Expanding and improving transit, air, passenger rail, bicycle and pedestrian options throughout the state.** Many Missourians expect more non-highway travel options. The majority of current transportation funding is legally restricted to use on highways and bridges and barely covers the cost of maintaining that system. Additional transportation funding that could be used on any mode of transportation must be made available to expand the frequency and service area for non-highway transportation services.
6. **Providing accessibility to all users of the transportation system.** Missouri's transportation system must provide all users access to opportunities — including employment, recreational activities, medical services, etc. Features such as navigable sidewalk grades, safe curb cuts and ramps and wheelchair-friendly buses help ensure the

system better meets the needs of all users. Transportation projects and services must be developed to better accommodate the varying abilities of all Missourians.

STAYING CONNECTED

MoDOT regularly engages with Missouri citizens — from project open houses to toll-free customer service telephone lines to a strong, inclusive planning process.

But through the unprecedented outreach efforts of On the Move, MoDOT engaged with a broader range of citizens. MoDOT went well beyond the typical planning partners by actively seeking out members of the business community and general public. MoDOT expanded the range of input by conducting Listening Sessions at college campuses, local chambers of commerce and hospitals. MoDOT employees touched every county through the Mobile Tour. And through these expanded efforts of citizen types and geographies, MoDOT expanded its understanding of what Missouri citizens want and need from their transportation system.

Essentially, MoDOT already knew a lot about what Missourians want and need — but because they talked to more people, they now know much more than before. What has been learned or reinforced?

People experience transportation personally. From wanting all rural highways to have shoulders to requests for a stop sign to be added at a specific location, Missourians' view of transportation is wide-ranging. There's no one-size-fits-all conversation to be had about transportation issues. MoDOT has to be prepared to talk and consider feedback about transportation issues at the level that makes sense for each citizen.

Missourians generally experience one transportation system. Most citizens don't know — and shouldn't have to know — whether they are using a part of the state transportation system or a local transportation system. MoDOT has been sharing information from On the Move with local partners and will work more diligently toward cooperative planning approaches.

More Missourians care about transportation. MoDOT already has great relationships with many partners and stakeholders. Through the expanded On the Move efforts, there are new opportunities to cultivate relationships with more Missourians who care about transportation.

By staying connected, MoDOT can continue to learn from and adapt to a wider range of stakeholder concerns and priorities. **By staying connected, MoDOT remains focused on its customers.**

The journey over the last several years has demonstrated it takes hard work to change the culture and produce the results Missourians want and expect. More hard work will be required to stay focused on refining policies and practices, push the boundaries even further and deliver transportation solutions with whatever level of funding is provided.